

UNITED STATES PATENT AND TRADEMARK OFFICE

BEFORE THE PATENT TRIAL AND APPEAL BOARD

MERCEDES-BENZ USA, LLC,
Petitioner,

v.

YECHEZKAL EVAN SPERO
Patent Owner.

U.S. Patent No. 9,955,551 to Spero

Case No.: IPR2023-01040

PATENT OWNER'S RESPONSE TO PETITION

TABLE OF CONTENTS

Table of Authorities	iv
List of Exhibits.....	vii
I. Introduction.....	1
II. Overview of the '551 Patent.....	2
III. Level of Ordinary Skill.....	6
IV. Claim Construction.....	6
V. The Applied References	8
A. Alden	8
VI. The Strict Contours of Anticipation	19
VII. The Challenged Claims are Patentable.....	23
A. All Grounds - Petitioner's Reading of Alden's Figure 5 Embodiment is Outside the Four Corners of the Reference	24
B. Ground 1: Alden, Ground 2: Alden-Beam, and Ground 3: Alden-Kobayashi.....	29
1. Independent Claim 48 (Alden).....	29
a. Alden Does Not Teach the Claim Limitations <i>"selecting a first cluster of the LEDs to emit first light directed towards a first area including the at least the portion of at least one object . . . the first light determined based at least in part on classifying the object"</i>	29
b. Alden Does Not Teach the Claim Limitations 48[j] <i>"control light emitted from the first cluster directed towards the first area to be different in at least one emission characteristic, based on the first light determination, from second light emitted from a second, different cluster of the LEDs, directed towards one or more illuminated second areas at a common elevation with the first area and laterally adjacent to the area"</i>	33

2. Independent Claim 56: Alden Does Not Teach the Claim Limitations “*reduce intensity of illumination to non-glaring illumination of a first area associated with the at least one other vehicle, relative to intensity of illumination on both sides of the first area at elevations common with the first area illuminated by a second cluster of the LEDs, by control of emission from the first cluster*” 41
3. Independent Claim 64: Alden Does Not Teach the Claim Limitations (i) “*control a first change to one or more characteristics of the light associated with the first cluster of the LEDs that is directed towards the other vehicle, that diminishes glare to a driver of the other vehicle when the other vehicle is at the first position*”, and (ii) “*control a second, subsequent change, to one or more characteristics of the light that is subsequently directed towards the other vehicle, that diminishes glare to the driver of the other vehicle when the other vehicle is at the second position*” 42
4. Independent Claim 72: Alden Does Not Teach the Claim Limitations (i) “*vary illumination provided to the target by the selected cluster, relative to illumination provided to areas laterally adjacent to the target and provided by at least one LED different from LEDs in the selected cluster*” and (ii) “*maintain a variance of illumination provided to the target relative to the laterally adjacent areas, when subsequent data from one or more of the cameras indicates a change in position of the target relative to the motor vehicle, by repeating the determination of target location, selection of the cluster and variance to illumination provided to the target, relative to the laterally adjacent areas, based on the subsequent data*” 46
5. Independent Claim 80: Alden Does Not Teach the Claim Limitations “*change, responsive to the positions associated with the target, first light associated with one or more LEDs aimed toward at least a portion of the target, relative to second light associated with other one*

	<i>or more of the LEDs aimed laterally adjacent the target on either side, as the target moves relative to the motor vehicle”</i>	49
6.	Dependent Claims 50/58/66/74/82: Alden Does Not Teach the Claim Limitations “ <i>identify an upcoming road curvature</i> ” and “ <i>accommodate the upcoming road curvature by adaptation of a light pattern of at least one of the at least one headlamps</i> ”	50
7.	Dependent Claims 51/59/67/75/83: Alden Does Not Teach the Claim Limitations “ <i>accommodate the road curvature by changing illumination in at least a direction of the road curvature by adaptation of the light pattern in at least one of color, intensity, or spatial distribution</i> ”	53
8.	Dependent Claim 51: Alden Does Not Teach the Claim Limitations “ <i>the control of the light emitted from the first cluster includes a change of at least one LED of the cluster to a non-emitting state</i> ”	58
9.	Dependent Claims 53/61/69/77/85: Alden Does Not Teach the Claim Limitations “ <i>identification of the upcoming road curvature is based at least in part on sensor data provided by one or more of the sensors of the vehicle and wherein the adaptation of the light pattern is based at least in part on the sensor data</i> ”	60
C.	Alden Alone Does Not Render Obvious Any of the Challenged Claims.....	62
VIII.	Conclusion	65
	Certificate of Service	67
	Certificate of Compliance Pursuant to 37 C.F.R. § 42.24	68

Table of Authorities

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<i>ActiveVideo Networks, Inc. v. Verizon Communications, Inc.</i> , 694 F.3d 1312 (Fed. Cir. 2012)	64
<i>Alison Hi-Tech Co. v. Int’l Trade Comm’n</i> , 936 F.3d 1353 (Fed. Cir. 2019)	passim
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<i>Guangdong Alison Hi-Tech Co. v. Int’l Trade Comm’n</i> , 936 F.3d 1353 (Fed. Cir. 2019)	passim
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<i>Phillips v. AWH Corp.</i> , 415 F.3d 1303 (Fed. Cir. 2005)	6, 30
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<i>Seymour v. Osborne</i> , 11 Wall. 78 U.S. 516 (1870).....	21, 23, 31, 52
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35 U.S.C. § 102	passim
35 U.S.C. § 112	7

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Exhibit No.	Description
2001	Declaration of Matthew A. Turk, Ph.D.
2002	Curriculum Vitae of Matthew A. Turk, Ph.D.
2003	Best Practices and FAQs for Filing Requests for Reexamination Compliant with 37 CFR 1.510 and 1.915, PTAB, May 2010
2004	<i>Intentionally left blank.</i>
2005	Petition challenging U.S. Patent No. 9,955,551, <i>Mercedes-Benz USA LLC v. Yechezkal Evan Spero</i> , IPR2023-01040, June 7, 2023
2006	U.S. Published Patent Application US2003/0137849A1 to Alden, Prosecution History in the U.S. Patent and Trademark Office
2007	Wards Auto “Prospects Bright for Lighting Sensor Supplier Hella,” Roger Schreffler Wards Auto, June 6, 2017 (Available at https://www.wardsauto.com/technology/prospects-bright-lighting-sensor-supplier-hella)
2008	Automotive World, “Hella: Matrix LED technology makes its debut”, February 13, 2014 (Available at https://www.automotiveworld.com/news-releases/hella-matrix-led-technology-makes-debut/)
2009	<i>Intentionally left blank.</i>
2010	ATZ Worldwide “Multi-row Headlamp System in the Mercedes-Benz E-Class,” Franz-Josef Kalze, February 2016 (Available at https://link.springer.com/article/10.1007/s38311-015-0105-y)
2011	<i>Intentionally left blank.</i>
2012	PR Newswire, “Mercedes Multibeam LED headlamps – in a class of their own,” June 22, 2016 (Available at https://www.prnewswire.com/news-releases/mercedes-multibeam-led-headlamps--in-a-class-of-their-own-300288628.html)
2013	Complaint, <i>Torchlight v. Daimler et al.</i> , Case No. 1:21-CV-751 District of Delaware, filed June 7, 2022

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2014	Reexamination Application Certified File History of U.S. Patent No. 9,955,551
2015	<i>Intentionally left blank</i>
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2040	Second Declaration of Matthew A. Turk, Ph.D.
2041	Transcript of Deposition of Nikolaos Papanikolopoulos, Ph.D. Mercedes Benz-USA, LLC v. Yechezkal Evan Spero, taken on February 23, 2024 IPR2023-01039, IPR2023-01040
2042	<i>Intentionally left blank</i>
2043	<i>Intentionally left blank</i>
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2048	<i>Intentionally left blank</i>
2049	<i>Intentionally left blank</i>
2050	<i>Intentionally left blank</i>
2050	Jianzhong Jiao and Ben Wang, “Etendue Concern for Automotive Headlamp Using LEDs,” SPIE Proceedings Vol. 5187, (January 2004) (Available at https://www.spiedigitallibrary.org/conference-proceedings-of-spie/5187/0000/Etendue-concerns-for-automotive-headlamps-using-white-LEDs/10.1117/12.504363.short)
2051	Michael Bass, <i>Handbook of Optics</i> 3 RD Edition Volume II, (McGraw-Hill, 2010) (Available at https://www.worldcat.org/title/555545456)
2052	Ben Wang and Jianzhong Jiao “Studies for Headlamp Optical Design Using LEDs,” SAE Technical Paper Series 2004-01-0434, (March 2004) (Available at https://www.sae.org/publications/technical-papers/content/2004-01-0434/)
2053	Ben Wang and Jianzhong Jiao “Optical Transform Limitations in Headlamp Photometric Performance,” SAE Technical Paper Series 2005-01-0861, (April 2005) (Available at https://www.sae.org/publications/technical-papers/content/2005-01-0861/)
2054	<i>Intentionally left blank</i>
2055	Jianzhong Jiao and Ben Wang “High-Efficiency Reflector Optics for LED Forward Lighting,” SPIE Proceedings Vol. 6670, (September 2007) (Available at https://www.spiedigitallibrary.org/conference-proceedings-of-spie/6670/66700M/High-efficiency-reflector-optics-for-LED-automotive-forward-lighting/10.1117/12.730524.short)
2056	Navigant Consulting “Energy Saving Estimates of Light Emitting Diodes in Niche Lighting Applications” Building Technologies Program Office of Energy Efficiency and Renewable Energy U.S. Department of Energy (September 2008) (Available at Energy Savings Estimates of Light Emitting Diodes in Niche Lighting Applications (Technical Report) OSTI.GOV.)

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2058	<i>Intentionally left blank</i>
2059	<i>Intentionally left blank</i>
2060	Michael Bass, <i>Handbook of Optics</i> 3 RD Edition Volume V, (McGraw-Hill, 2010) (Available at https://www.worldcat.org/title/557121959 .)
2061	Texas Instruments/Digikey “How DLP Technology Works,” (Available at https://www.digikey.com/en/product-highlight/t/texas-instruments/dlp-technology .) (Accessed September 12, 2023.)
2062	Texas Instruments “Introduction to +/- 12 Degree Orthogonal Digital Micromirror Devices (DMDs) (Available at https://www.ti.com/lit/an/dlpa008b/dlpa008b.pdf?HQS=dis-dk-null-digikeymode-dsf-pf-null-ww&DCM=yes&distId=10) (Accessed September 12, 2023.)
2063	Surendra Gupte, Osama Masoud, Robert F.K. Martin, and Nikolaos P. Papanikolopoulos “Detection and Classification of Vehicles” IEEE Transactions on Intelligent Transportation Systems, Vol. 3, No. 1, (March 2002) (Available at https://ieeexplore.ieee.org/document/994794) (Accessed February 20, 2024)
2064	<i>Intentionally left blank</i>
2065	Webster’s New Universal Unabridged Dictionary Deluxe 2 nd Edition excerpts, Simon and Schuster (1983)

Pursuant to 37 C.F.R. §42.107, Patent Owner, Yechezkal Evan Spero (“Patent Owner”), submits the following Response (“Response”) to the Petition for *Inter Partes* Review (“Petition”) filed by Mercedes-Benz USA, LLC (“Petitioner”) that challenges Claims 48-87 (“Challenged Claims”) of U.S. Patent No. 9,955,551 (“the ’551 Patent”).

I. Introduction

By falling short of the rigorous standard for anticipation, Petitioner fails to meet its burden of proof for many of the Challenged Claims. Petitioner vacillates between two irreconcilable positions—Alden’s figures are at once, both high level “concept diagrams”—per their own expert—and figures that can be relied on to show precise details or positioning. This tension is further underscored by Petitioner’s expert testimony, that Alden’s seminal Figure 5 LED embodiment is a “high-level schematic” that would require “speculation” to interpret how it functions as a working lamp. As a result, many of Petitioner’s anticipation proofs require impermissible modifications beyond the scope of Alden’s four corners. Further, due to a lack of crucial teachings, certain relied-on Figure 5 descriptions are not enabled— and Petitioner points to no “inherent” concepts from Alden to fill in the blanks.

Petitioner’s reliance on such a theoretical reference for anticipation is misplaced. Petitioner chose the Alden reference—as the “master of the Petition” it

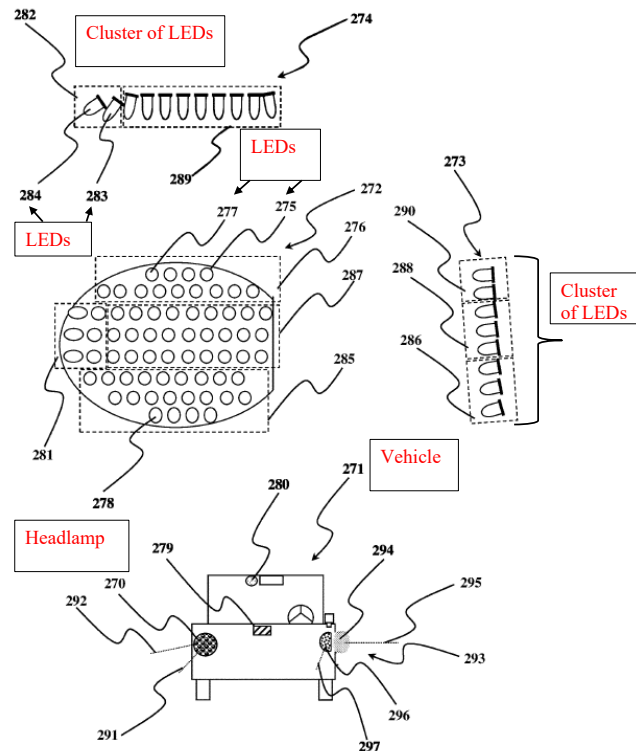
cannot now revise the Petition to bolster its anticipation proofs. At the same time, its obviousness contentions with respect to Alden alone are wholly lacking, never identifying a single modification to Alden or explaining what a POSA might be motivated to change. The mere statement of an alternative obviousness theory is *per se* insufficient.

Finally, as detailed below, Petitioner's proofs also fail to meet discrete claim limitations for several dependent claims. When considered under the correct constraints of anticipation-type arguments, most of Petitioner's arguments fall short of proof. For these reasons, and others explained below, the Board should determine that the Challenged Claims have not been shown, by a preponderance of evidence, to be unpatentable.

II. Overview of the '551 Patent

The '551 Patent discloses "a novel multi-light source approach to the design and construction of solid-state lighting fixtures (vs. solid state lamps), which is termed a 'Digital Lighting Fixture', due to the control of individual lighting element 'digits' to provide the 'correct' lighting solution for the situation at hand." (Ex.1001, 11:8-13; Ex.2040, ¶50.) The '551 Patent further explains that "[t]he terminology 'digital' as used herein refers to the discrete nature of the multiple LED lamps provided in the luminaire, whereby, 'digital' control results from the individual control of the discrete, *i.e.*, 'digital' lighting elements, the LEDs, in the

luminaire.” (Ex.1001, 2:65-3:3; Ex.2040, ¶50.)



(Ex.1001, Figure 15, Annotated)

The '551 Patent describes “a different approach which is to provide the end user with the most correct lighting solution not a new technology lamp to replace the old one.” (Ex.1001, 11:5-8; Ex.2040, ¶51.) “In contrast to a prior art, single large, lamp replacement like light source, the present invention provides multiple, small sized sources of differing characteristics such that the effect of the whole is greater than the sum of the individual parts.” (Ex.1001, 11:45-49; Ex.2040, ¶51.) “The added controllability offered by breaking the total light output up into discrete (‘digital’) specifically aimable and dimmable elements which can be

addressed by control electronics to effect intensity, spectrum and spatial distribution of intensity and spectrum, yields a lighting fixture (vs. lamp) of unparalleled performance.” (Ex.1001, 11:56-62; Ex.2040, ¶51.) The ’551 Patent explains how to use its “digital lighting” in the context of headlamps to “provide the optimal lighting solution in real-time” – whether that be for predictive curve illumination (Ex.1001, 57:31-37), to preserve forward illumination while preventing glare (*Id.*, 52:54-65), or both (*Id.*, 53:34-44; Ex.2040, ¶51).

The ’551 Patent describes a multitude of sensor-based techniques for observing a scene, analyzing a scene, determining varied illumination for a scene, etc. This can include determining what objects are within the scene and what illumination should correlate to those objects (Ex.1001., 44:36-44; Ex.2040, ¶52.) The ’551 Patent notes the general applicability of the varied concepts across embodiments and specifically notes that techniques described elsewhere at least correspond to headlights (Ex.1001, 52:66-53:4; Ex.2040, ¶52.) The ’551 Patent explains that, by using “digital” headlamps with known light directionality of discrete source elements, such as LEDs, it is possible to “continue to illuminate far ahead (in high beam) without blinding oncoming traffic.” (Ex.1001, 52:54-61; Ex.2040, ¶52.) This allows for determination of “what exact aiming is the maximum allowable for any given traffic situation and the road layout.” (Ex.1001, 52:64-65; Ex.2040, ¶52.)

The '551 Patent also recognizes that different “objects” may be in the field of view in a variety of lighting situations, and that different light output may be appropriate to accommodate these different objects. (Ex.1001, 44:36-45:44; Ex.2040, ¶53.) In the context of headlamps, it can, for example, determine types of objects, *e.g.*, without limitation, whether something is a vehicle or a sign, and respond differently to each object. With regards to a preceding vehicle, it may reduce illumination of the vehicle and with regards to a preceding sign it may increase illumination of the sign. It can also make these accommodations at the same time, because of the discrete nature of the directional light sources — “use the controller and properly aimed SLS to follow and illuminate distant overhead and roadside signs for a longer time, yet not blind oncoming traffic due to the narrow beam.” (Ex.1001, 52:43-53:4; Ex.2040, ¶53.) This is a headlamp embodiment employing, among other things, the described notion of “task lighting” – contemplation of varied illumination needs within an illuminated scene. (Ex.1001, 52:67-53:1; Ex.2040, ¶53.)

Thus, the '551 Patent provides a comprehensive solution for the control and use of light and extends the application to headlamps that can accommodate other traffic without blinding it, predictively illuminate road curvatures, and differentially illuminate objects in a scene based on object recognition. All of this lends itself to the complete headlamp solution contemplated and described – a

solution where “[a]t any instant in time the intensity, spectrum and beam pattern of the headlamp may be varied as a function of the driver’s intent, lay of the road and environmental factors.” (Ex.1001, 51:49-52; Ex.2040, ¶54.) The marrying of the ’551 techniques with the headlamp embodiments results in a headlamp with highly controllable emission elements that, “[w]hen combined with devices capable of detection changes in the surrounding environment the flexible DLF is capable of changing the illumination so as to provide the optimal lighting solution in real-time.” (Ex.1001, 57:33-37; Ex.2040, ¶54.)

III. Level of Ordinary Skill

Patent Owner does not dispute Petitioner’s proposed skill level for a person of ordinary skill in the art (“POSA”) because Dr. Turk clearly satisfies it. (Petition, 9; Ex.2040, ¶¶8-22; 56-61.)

IV. Claim Construction

“[T]he words of a claim ‘are generally given their ordinary and customary meaning,’ [which] . . . is the meaning that the [words] would have to a person of ordinary skill in the art in question at the time of the invention, *i.e.*, as of the effective filing date of the patent application.” *Phillips v. AWH Corp.*, 415 F.3d 1303, 1312-13 (Fed. Cir. 2005) (*en banc*) (internal citations omitted). Because of their context, “[t]he claims themselves provide substantial guidance as to the meaning of particular claim terms.” *Id.* at 1314. “The claims, of course, do not

stand alone . . . [and] ‘must be read in view of the specification, of which they are a part.’” *Id.* at 1315 (quoting *Markman v. Westview Instruments, Inc.*, 52 F.3d 967, 978-979 (Fed. Cir. 1995)). “The specification ‘is always highly relevant to the claim construction analysis. Usually, it is dispositive; it is the single best guide to the meaning of a disputed term.’” *Id.* (quoting *Vitronics Corp. v. Conceptronic, Inc.*, 90 F.3d 1576, 1582 (Fed. Cir. 1996)). In that regard, “the person of ordinary skill in the art is deemed to read the claim term not only in the context of the particular claim in which the disputed term appears, but in the context of the entire patent, including the specification.” *Id.* at 1313. “The importance of the specification in claim construction derives from its statutory role. The close kinship between the written description and the claims is enforced by the statutory requirement that the specification describe the claimed invention in ‘full, clear, concise, and exact terms.’” *Id.* at 1316 (quoting 35 U.S.C. § 112, ¶1).

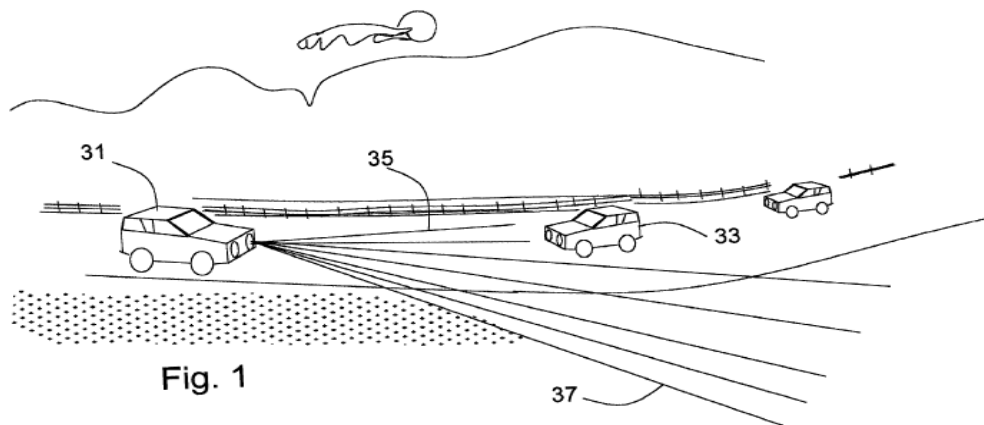
Claim terms are construed to the extent necessary to resolve the controversy. *See Wellman, Inc. v. Eastman Chem. Co.*, 642 F.3d 1355, 1361 (Fed. Cir. 2011). Here, properly construed according to its ordinary meaning, and as supported by the specification of the ‘551 Patent, the independent claim 48 term *classifying the object* is not taught by the Alden reference relied upon by Petitioner. Similarly, properly construed according to its ordinary meaning, and as supported by the specification of the ‘551 Patent, the dependent claim 53/61/69/77/85 term *the*

sensor data also is not taught by the Alden reference relied upon by Petitioner. The ordinary meaning of *classifying the object* in claim 48, and *the sensor data* in dependent claims 53/61/69/77/85 is provided below.

V. The Applied References

A. Alden

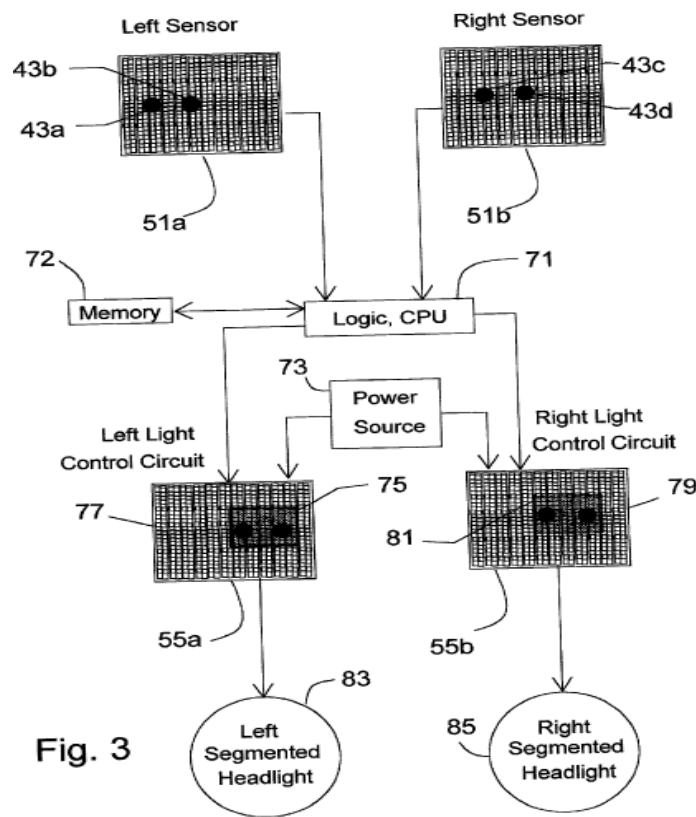
Alden is directed to controlling the distribution of light by a vehicle headlight. Alden's systems include headlights that produce multiple individually controllable beam segments of light, each illuminating a sector of an area ("distribution area") ahead of the vehicle equipped therewith ("equipped vehicle"). (Ex.1005, ¶¶[0002], [0004-0006], [0008]; Ex.2040, ¶66.)



(Ex.1005, FIGURE 1)

The systems also include sensors 51a, 51b for detecting incoming light received from the distribution area, which sensors 51a, 51b are divided into multiple sectors associated with sectors of the distribution area illuminated by the beam segments of the headlight of the equipped vehicle. (Ex.1005, ¶¶[0027-0028],

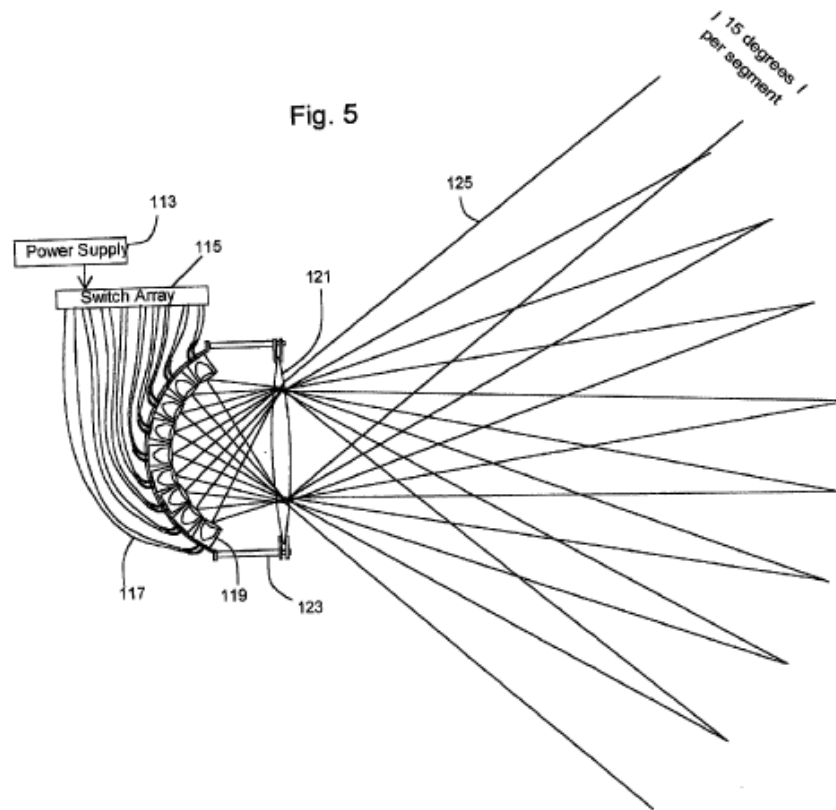
Fig. 4.; Ex.2040, ¶67.)The systems further include a central processing unit (CPU) 71 that determines whether incoming light detected in each sector of the sensors 51a, 51b has an intensity that exceeds a threshold value. (*Id.*)



(Ex.1005, FIGURE 3)

In the first of the three distinct embodiments, the headlight system dims the intensity of selected beam segments produced by the headlight of an equipped vehicle that have a relationship to a sector or sectors in the distribution area. (Ex.1005, ¶¶[0025-0026], [0029], Figures 1, 2, 5; Ex.2040, ¶68.) Per Figure 5, a headlight 123 employs a single-row array of light emitting diode (LED) elements 119 and a double convex lens 121 for directing the beam segments produced by the

LED elements 119 that illuminate different sectors of the distribution area. (*Id.*)

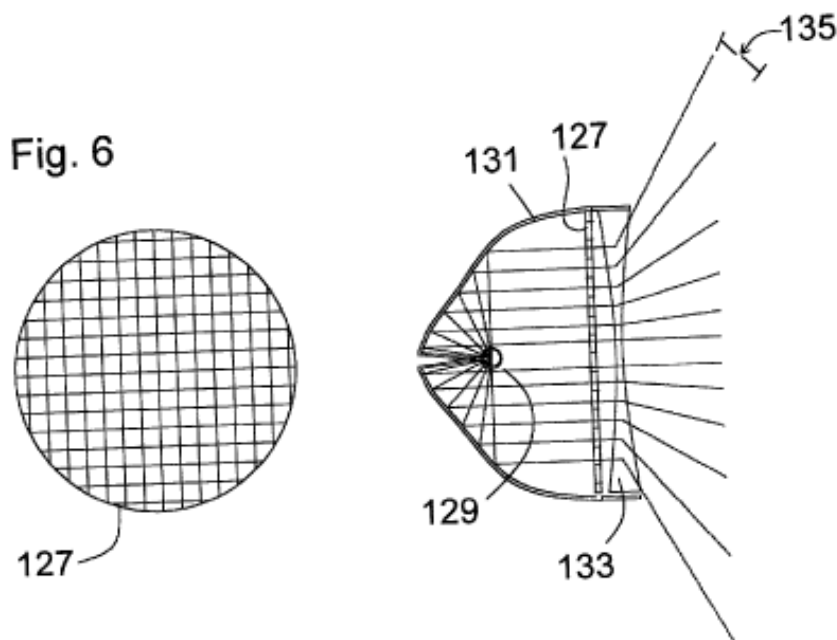


(Ex.1005, FIGURE 5)

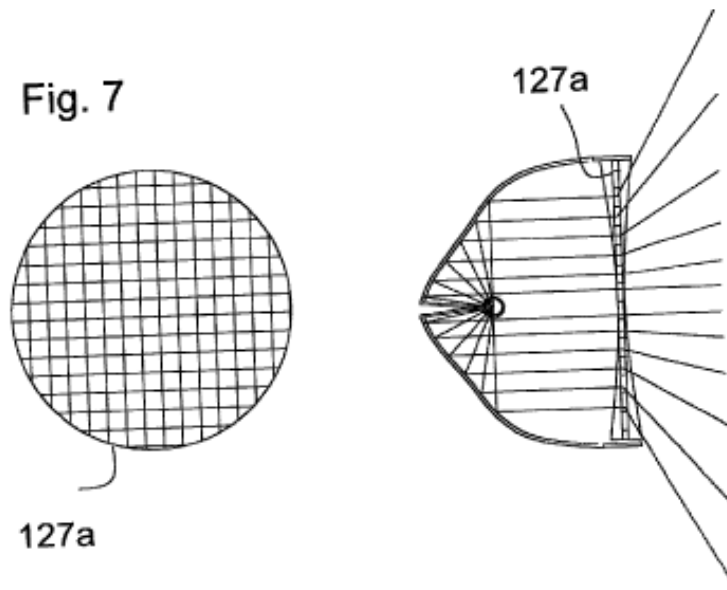
The CPU 71 may determine the sector or sectors of the sensors 51a, 51b receiving incoming light from the distribution area that have a detected threshold intensity, which are used to create a region within which light is to be dimmed. (*Id.*, ¶¶[0026-0029]; Ex.2040, ¶69.) In response, the CPU 71 controls the headlight 123 to dim some number of the beam segments produced by the individual LED elements 119. (*Id.*) Alden uses a convex lens with a curved LED array in this

arrangement to create output where LED 119 is responsible for sector 125.
(Ex.1005, ¶[0029]; Ex.2040, ¶69.)

Such operations may also be accomplished by the second embodiment, another different headlight system embodiment shown in Figures 6 and 7. As seen therein, the second embodiment employs a single light source 129 and a collimating reflector 131 to produce collimated light which may be segmented using electro-chromatic dimming elements 127 that, in conjunction with a double concave lens 133, can dim a given segment. (*Id.*, ¶[0030-0031], Figures 6, 7; Ex.2040, ¶70.) In Fig. 7 the electro-chromatic elements 127a are within the double concave lens. (Ex.1005, ¶[0031]; Ex.2040, ¶70.)

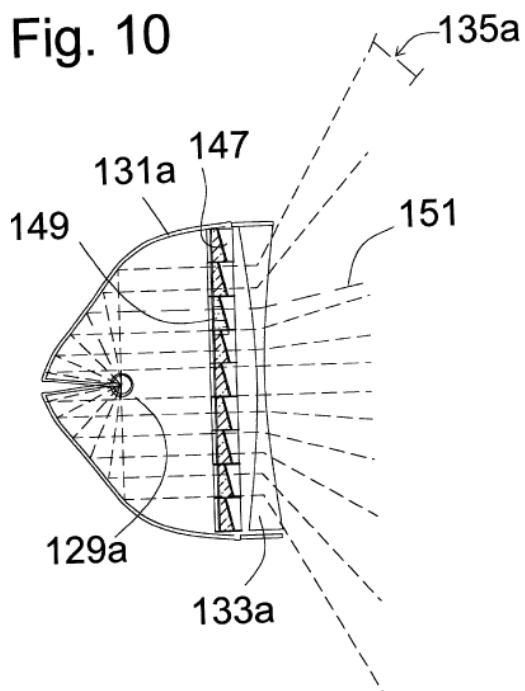


(Ex.1005, FIGURE 6)



(Ex.1005, FIGURE 7)

A third embodiment is shown in Figure 10, in which the headlight system employs a single light source 129, a collimating reflector 131, and electro-optic refractive elements 147, 149 to produce multiple light beam segments. (*Id.*, ¶¶[0032-0040]; Ex.2040, ¶71.) The CPU 71 can control the electro-optic refractive elements 147, 149 to change the direction of the beam segments passing through that element (*Id.*)



(Ex.1005, FIGURE 10)

In this third embodiment, the electro-optical refractive material 147, 149 are bi-refrignent liquid crystals, the principles of which Alden describes as well known in the prior art. (Ex.1005, ¶[0033]; Ex.2040, ¶72.)¹ As seen in Figures 8 and 9, the birefringent liquid crystals can direct light in only two directions – straight and “bent” in one direction. (*Id.*, ¶¶[0050-0052]; Ex.2040, ¶72.)

¹ Birefringent: “having the quality of birefringence”; Birefringence: “the power of double refraction.” (Ex.2065, 186).

Fig. 8

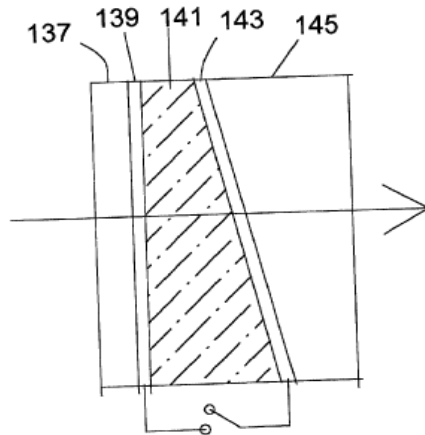
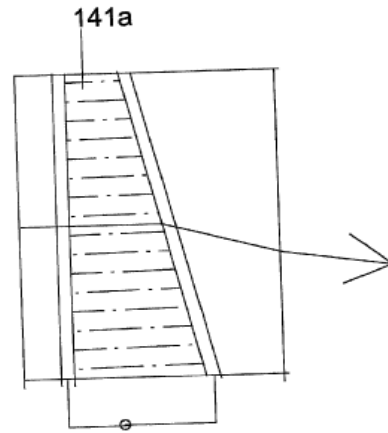


Fig. 9



(Ex.1005, FIGURES 8, 9)

In addition, all beam segments of Alden's various segmented beam headlight embodiments are always at high intensity unless specifically dimmed—as described in relation to Figure 2, “61 produces a high beam in a first sector 65 while concurrently producing a low beam in a second respective sector 63 (or dim beam) where the 41 is sensed ... Thus the driver of 47 can see everything illuminated to the maximum.” (Ex.1005, ¶¶[0006], [0026]; Ex.2040, ¶73.) In that regard, Alden states in connection with Figure 3 that those portions of the left and right segmented headlight not dimmed will be on high beam: “[t]he 55a [and 55b] controls the power flow from 73 to a left [and right] segmented headlight 83 which distributes high beams throughout its distribution areas except in a box in the

direction of 41.”² (*Id.*, ¶[0027]; Ex.2040, ¶73.) In connection with the Figure 6 second embodiment, Alden states that “the light intensity flowing through each individual segment is controlled by causing each individual electro-chromatic cell to filter out the desired amount of light such that the distribution of light is dim where a car is sensed and on high beam elsewhere.” (Ex.1005, ¶[0035]; Ex.2040, ¶73.) And, in connection with the Figure 10 third embodiment, Alden states that those beam segments not diverted for an oncoming vehicle “are in high beam.” (Ex.1005, ¶[0035]; Ex.2040, ¶73.) More generally, Alden states in conjunction with Fig. 2 that “the driver of [vehicle] 47 can see everything illuminated to the maximum except the area where [vehicle] 41 is” providing a “highly functional and reliable means for providing maximum light for an equipped vehicle’s driver.” (Ex.1005, ¶¶ [0026], [0060]; Ex.2040, ¶73.)

Alden thus discloses headlight embodiments that provide segmented illumination. (Ex.1005, ¶¶[0008], [0029-0038]; Ex.2040, ¶74.) Alden outlines three distinct embodiments. (Ex.1005, ¶¶[0029-0030], [0035]; Ex.2040, ¶74.) For example, Alden states that “FIG. 5 illustrates the segmented headlight means and controlling switch array in a first embodiment.” (Ex.1005, ¶[0029]; Ex.2040, ¶74.)

² Petitioner’s expert confirmed that this is one of the objectives of Alden’s system. (Ex.2041, 50:9-12.)

Alden also states that “FIG. 6 illustrates headlight distribution area segmenting means of a second embodiment. ... The collimated light passes through a segmented array 127 of electro-chromatic cells” (Ex.1005, ¶[0030]; Ex.2040, ¶74), and that “FIG. 7 is identical to FIG. 6 except that the alternate segmented electro-chromatic element 127a is incorporated into the optic (whereas they were separate components in FIG. 6)” (Ex.1005, ¶[0031]; Ex.2040, ¶74.) Alden further states that “FIG. 10 depicts a segmented headlight with individually controlled sectors of distribution of the third embodiment.” (Ex.1005., ¶[0035]; Ex.2040, ¶74.)

In these three distinct embodiments, Alden’s headlight systems with segmented light distribution elements are designed to provide a high beam to all distribution area sectors except those from which light exceeding a threshold has been detected, in which sectors the systems either selectively change the intensity or lower the direction of beam segments. (Ex.1005, ¶¶[0029-0030], [0033-0035]; Ex.2040, ¶75.) As demonstrated above, Figure 5 illustrates a first headlight embodiment that is capable of selectively dimming beam segments produced by LEDs 119. (Ex.1005, ¶[0029], Fig. 5; Ex.2040, ¶75.) Figures 6 and 7 illustrate a second headlight embodiment that is capable of selectively dimming beam segments having a single point light source 129 and a collimating reflector 131. In this second embodiment, an electro-chromatic material is used that changes transmissivity depending on its state. (Ex.1005, ¶[0030-0031], Figs. 6-7; Ex.2040,

¶75.) In Alden's third embodiment described in connection with Figures 8-10, the electro-optical refractive material 147, 149 allows collimated light to be emitted either along a forward axis or an angled axis via refraction. (Ex.1005, ¶[0033], Figs. 8-9; Ex.2040, ¶75.)

These three embodiments are discrete and include features that are incompatible with each other. (Ex.2040, ¶76.) For example, the second headlight system embodiment of Figures 8-10 having electro-optical refractive material 147, 149 for changing the direction of light passing therethrough is designed to work with collimated light produced by single point light source 129 and collimating reflector 131. (Ex.1005, ¶¶[0033-0035], Figs. 8-10; Ex.2040, ¶76.) However, in the first headlight system embodiment of Figure 5, the LED elements 119 of headlight 123 produce non-collimated light. (Ex.2040, ¶76.) Non-collimated light could not be directed in any meaningful fashion by electro-optical refractive material 147, 149 as shown in Figure 10. (Ex.1005, ¶¶[0033-0035]) Rather, non-collimated light would blend and have different incident angles on the electro-optical refractive material 147, 149, thereby preventing the electro-optical refractive material 147, 149 from performing any meaningful control of beam segments, as well as redirecting much of the non-collimated light they receive away from the desired sectors of the distribution area. (*Id.*) Any headlight resulting from a combination of Alden's incompatible features would therefore be incapable of meeting the basic

requirements of a headlight, *i.e.*, effectively illuminating the area ahead of the equipped vehicle, let alone directing its emitted light in any meaningful fashion. (*Id.*) Indeed, rather than suggesting combinations of various features of its different headlight system embodiments, Alden only states generally that each of its headlight system embodiments may employ the sensing elements 51a, 51b discussed in connection with Figures 3 and 4. (Ex.1005, ¶¶[0044-0046]; Ex.2040, ¶76.)

Additionally, Alden's disclosure is theoretical in nature. The disclosure broadly describes certain features of headlight systems and the general functions such features and systems would desirably provide but lacks detailed explanations as to how those features and systems are practically implemented or how those functions are realized. (Ex.2040, ¶77.) As such, the reference is ambiguous on certain points and fails to enable its disclosure in critical respects. (Ex.1005, ¶[0027-0035]; Ex.2040, ¶77.)³ For example, while Alden depicts control circuit switch array switches in Figure 3 for dimming certain headlight beam segments

³Notably, Alden contacted Gentex Corporation, an automotive industry supplier, regarding his segmented headlight system and was informed that Gentex's technical staff had determined the system to be "futuristic" and likely "years away from any practical use." (Ex.2006, 39; Ex.2040, ¶78.)

while leaving other beam segments on high intensity, it does not describe or specifically demonstrate how such operations are accomplished using the one-dimensional array of LED elements 119 of headlight 123 illustrated in Figure 5. (*Id.*) Similarly, in connection with Figure 4, Alden describes progressing through the sectors of sensors 51a, 51b of Figure 3 to detect incoming light, but it does not explain how those sensor sectors are mapped to either the one-dimensional array of LED elements 119 shown in Figure 5, the one-dimensional array of switches 115 for that array, or the particular distribution area sectors depicted therein. (*Id.*) In fact, Alden specifically states that the switch arrays of the light control circuits 55a, 55b shown in Figure 3 are merely for illustrative purposes. (*Id.*)

VI. The Strict Contours of Anticipation

“A patent claim is invalid as anticipated only if each and every element of the claim is expressly or inherently disclosed in a single prior art reference.” *Guangdong Alison Hi-Tech Co. v. Int’l Trade Comm’n*, 936 F.3d 1353, 1363–64 (Fed. Cir. 2019) (citing 35 U.S.C. § 102 (2006) and *SRI Int’l, Inc. v. Internet Sec. Sys., Inc.*, 511 F.3d 1186, 1192 (Fed. Cir. 2008)). In that regard, “[p]rior art that must be modified to meet the disputed claim limitation does not anticipate the claim ... Such modifications are permissible only in an obviousness analysis.” *Apple Inc. v. Corephotonics, Ltd.*, 861 F. App’x 443, 450 (Fed. Cir. 2021) (holding no anticipation, where the reference contained an error such that two lenses

occupied the same space, rendering the relied-on embodiment inoperative) *quoting Enplas Display Device Corp. v. Seoul Semiconductor Co.*, 909 F.3d 398, 405 (Fed. Cir. 2008). Similarly, “inoperative embodiments cannot be anticipatory.” *See In re Dowty*, 118 F.2d 363, 366 (CCPA 1941) (“[A]n inoperative prior art device may not be relied upon as an anticipation.”) (*quoting In re Kehl*, 101 F.2d 193, 195 (CCPA 1939)); *see also Corephotonics*, 861 F. App’x at 451.

Inherency requires a basis and/or technical reasoning to support a determination that an allegedly inherent characteristic necessarily flows from the applied reference's teaching. *See Ex parte Levy*, 17 USPQ.2d 1461, 1464 (Bd. Pat. App. & Inter. 1990). That a certain result or characteristic may occur or be present in an applied reference is insufficient to establish inherency of that result or characteristic. *See In re Rijckaert*, 9 F.3d 1531, 1534 (Fed. Cir. 1993).

To anticipate, the prior art disclosure must also be enabling. “A prior art reference anticipates a patent’s claim ... ‘when the four corners of [that] ... document describe every element of the claimed invention, either expressly or inherently, such that a [PHOSITA] could practice the invention without undue experimentation.’” *VirnetX Inc. v. Apple Inc.*, 665 Fed. App’x 880, 885 (Fed. Cir. 2016). That is, the claimed invention is not anticipated “if the allegedly anticipatory disclosures cited as prior art are not enabled.” *Elan Pharms., v. Mayo Foundation for Medical Ed. And Research*, 346 F.3d 1051, 1054 (Fed. Cir. 2003).

The interconnection between enablement and anticipation was further explained by the Supreme Court in *Seymour v. Osborne*: to "anticipate," the identical subject matter must not only be previously known, but the knowledge must be sufficiently enabling to place the information in the possession of the public. *Seymour v. Osborne*, 11 Wall. 516, 78 U.S. 516, 20 L.Ed. 33 (1870). The *Seymour* case goes on to explain:

Patented inventions cannot be superseded by the mere introduction of a [prior art reference] unless the description and drawings contain and exhibit a substantial representation of the patented improvement, in such full, clear, and exact terms as to enable any person skilled in the art of science to which it appertains, to make, construct, and practice the invention to the same practical extent as they would be enabled to do if the information was derived from a prior patent. Mere vague and general representations will not support such a defense, as *the knowledge supposed to be derived from the publication must be sufficient to enable those skilled in the art or science to understand the nature and operation of the invention, and carry it into practice use. Whatever may be the particular circumstances under which the publication takes place, the account published, to be of any effect to support such a defense, must be an account of complete and operative invention capable of being put into practical operation.*

Seymour, 78 U.S. at 555.

In addition, "it is not enough that the prior art reference . . . includes

multiple, distinct teachings that [an ordinary] artisan might somehow combine to achieve the claimed invention.” *Net MoneyIN, Inc. v. VeriSign, Inc.*, 545 F.3d 1359, 1371 (Fed. Cir. 2008). Instead, the reference must “clearly and unequivocally disclose the claimed [invention] or direct those skilled in the art to the [invention] without any need for picking, choosing, and combining various disclosures not directly related to each other by the teachings of the cited reference.” *Id.* (quoting *In re Arkley*, 455 F.2d 586, 587 (CCPA 1972) (emphasis in original)). Thus, anticipation cannot be proven merely by “multiple, distinct teachings in a single prior art document that the artisan might somehow combine to achieve the claimed invention.” *Microsoft Corp. v. Biscotti, Inc.*, 878 F.3d 1052, 1069 (Fed. Cir. 2017) (emphasis added). Instead, a reference may anticipate only if a POSA “reading the reference, would at once envisage the claimed arrangement or combination.” *Id.* at 1068 (emphasis added).

Anticipation also requires that a single reference “describe the claimed invention *with sufficient precision and detail* to establish that the subject matter existed in the prior art.” *Wasica Fin. GmbH v. Cont'l Auto. Sys., Inc.*, 853 F.3d 1272, 1284 (Fed. Cir. 2017); *see also Verve, LLC v. Crane Cams, Inc.*, 311 F.3d 1116, 1120 (Fed. Cir. 2002). For this reason, ambiguous references do not anticipate a claim. *See, e.g., W.L. Gore & Assocs., Inc. v. Garlock, Inc.*, 721 F.2d 1540, 1554 (Fed. Cir. 1983) (refusing to find claims anticipated when the prior art

references were “unacceptably vague”); *see also In re Hughes*, 345 F.2d 184, 188 (CCPA 1965); *In re Turlay*, 304 F.2d 893, 899 (CCPA 1962) (“It is well established that an anticipation rejection cannot be predicated on an ambiguous reference.”).

Because the Petition does not advance inherency arguments or supply the attendant proofs, Petitioner is limited to arguments related to the express teachings of Alden. Moreover, as the Petition relies exclusively on the emission embodiments disclosed in Figure 5, Petitioner’s arguments are equally limited to that embodiment. For such arguments, relied-upon embodiments must be enabled within the four corners of Alden to function as taught, per *Corephotonics*, as well as enable the claims to which they apply per *Seymour*, 78 U.S. at 555, and not be unacceptably vague or ambiguous with regards to whether an applied teaching covers the claim limitation to which it is applied, per *Wasica*.

VII. The Challenged Claims are Patentable

For **Ground 1**, Petitioner attempts to rely on Alden to satisfy the elements of claims 48, 50-51, 53-59, 61-67, 69-75, 77-83, and 85-87. (Petition, 5.) Of those, claims 48, 56, 64, 72, and 80 are independent claims, with the remaining claims depending directly or indirectly from one of those independent claims. (*Id.*, Fn. 2; Ex.2014, 1186-1190, 1216-1219.) For **Ground 2**, Petitioner attempts to combine Alden (alone or as modified by Stam) and Beam to satisfy the elements of

dependent claim 49, which depends from independent claim 48. (Petition, 5; Ex.2014, 1186.) For **Ground 3**, Petitioner attempts to combine Alden and Kobayashi to satisfy the elements of dependent claims 52, 60, 68, 76, and 84, which depend from independent claims 48, 56, 64, 72, and 80, respectively. (Petition, 5; Ex.2014, 1186-1190, 1216-1219.) Petitioner has failed to meet the requisite burden to prevail on any of these Grounds for at least the reason that Petitioner relies on the primary reference Alden to satisfy claim elements that Alden fails to teach.

A. All Grounds - Petitioner's Reading of Alden's Figure 5 Embodiment is Outside the Four Corners of the Reference

To argue that Alden anticipates the Challenged Claims, Petitioner impermissibly reads the teachings of Alden's first embodiment, the Figure 5 LED embodiment, contrary to the "four corners" of the Alden reference. "A prior art reference anticipates a patent's claim ... 'when the four corners of [that] . . . document describe every element of the claimed invention, either expressly or inherently, such that a [PHOSITA] could practice the invention without undue experimentation.'" *VirnetX Inc. v. Apple Inc.*, 665 Fed. App'x 880, 885 (Fed. Cir. 2016). Petitioner's contentions and those statements in the Institution Decision regarding the general and broad functionality of the Figure 5 system, assume two-dimensional control, though Alden provides none of the details needed to

implement such functionality. (Petition, 34-36; DI, 17.)

Regarding the Figure 5 LED first embodiment, Alden merely describes a row of LEDs positioned along **the** focal point of a lens. (Ex.1005, ¶[0029]; Ex.2040, ¶98.) Alden never mentions any additional rows/columns of LEDs next to the single row of LEDs shown in Figure 5, let alone provides an explanation of how LEDs in any such additional rows/columns of a two-dimensional array would be configured to work relative to a single focal point. (Ex.2040, ¶98.) Alden's depiction of the row of LEDs being positioned along the focal point of the lens undermines any conclusion that the Figure 5 LED embodiment expressly discloses a two-dimensional array. (Ex.2040, ¶98; DI, 17.)

Reliance on the Figure 3 description and/or the Figure 6 second embodiment to help understand the Figure 5 first embodiment is also inapposite. As mentioned in Section V.A supra, the Figure 5 LED, first embodiment is distinct from and incompatible with the Figure 6 second embodiment, which uses an electro-chromatic dimming means and a collimating surface, to generate a two-dimensional array of collimated light. (Ex.1005; Ex.2040, ¶99.) Because Figure 6 generates a two-dimensional array of collimated light and Figure 3 shows a two-dimensional sensor and switch array, the two are compatible. (Ex.2040, ¶99.) Without altering Figure 5, no such compatibility exists. (*Id.*) Given the fundamental differences between the Figure 6 electro-chromatic second

embodiment and the Figure 5 LED first embodiment, the two embodiments are not analogous. (*Id.*) And, Alden’s statement that the Figure 6 embodiment uses a “switch array similar to 115 and the process previously described herein” (Ex.1005, ¶[0030]) lacks sufficient precision and detail to “necessarily require” the Figure 5 LED embodiment to include a two-dimensional array. (Ex.2040, ¶99.)

On the contrary, with respect to the second and third embodiments, shown in Figures 6 and 10 respectively, Alden shows both a lamp configuration and a two-dimensional array depiction. Yet, with respect to Figure 5, Alden merely shows the lamp configuration and no array depiction. Given Alden’s express disclosure of arranging the LEDs “on a curve along the focal point” of the lens, (Ex.1005, ¶[0047]) it is reasonable to understand that Alden only intended usage of a single row of LEDs for this embodiment, and that anything else would require “speculation” outside the four corners of Alden’s teachings. (Ex.2040, ¶100.)

Moreover, a prior art reference does not anticipate if it must be modified to meet a challenged claim limitation. *Enplas Display Device Corp. v. Seoul Semiconductor Co.*, 909 F.3d 398, 405 (Fed. Cir. 2008). Alden fails to explain the existence of a two-dimensional array in Figure 5 in any manner – rendering it non-enabling as an anticipatory reference for claims that would require usage of a two-dimensional array and/or arguments relying on Figure 5 as showing a two-dimensional array.

Additionally, Alden's Figure 5 LED embodiment fails to provide an enabling disclosure of Petitioner's desired subject matter—a prerequisite for an anticipatory prior art document. *VirnetX Inc. v. Apple Inc.*, 665 Fed. App'x 880 (Fed. Cir. 2016). Quite simply, Petitioner has failed to establish **how** the two-dimensional switch array in Figure 3 could be used to operate even the one-dimensional LED array in Figure 5. (Ex.2040, ¶102.) Indeed, Petitioner's expert indicated that it is “*not clear*” and could not explain how the switch array shown in Figure 3 controls the LED array shown in Figure 5 to create the beam spread illustrated therein:

Q. Okay. So does the figure 3 description affect the total beam spread of the figure 5 embodiment?

A. The figure 3 can inform. But, again, this is a **concept**. So if you look at the number of rows on 77 and 79, it's not clear how many. Assuming that each element controls one LED, **it's not clear and I cannot count here.**

* * *

A. In figure 3. It's a reference as an array matrix. In other words, there are rows and columns. So here basically the disclosure is that each one of these controls one LED. And this is what the POSITA would understand at that time. So **it doesn't give me any information how many rows, how many columns we have. It's a concept diagram. There are no dimensions, no scale.**

(Ex.2041, 108:11-109:5.)

Moreover, since given sensor elements will correlate to different LEDs for creating emission responsive to illumination detected at different distances, when using the beam pattern of Figure 5, the lack of a mapping function for the Figure 5 beam pattern would require modification to create such a function to achieve control under the teachings of Figures 3/4. (Ex.2040, ¶104) The need for modifications limits Alden's use as an anticipatory reference for the Challenged Claims. *Apple Inc. v. Corephotonics, Ltd.*, 861 F. App'x 443, 450 (Fed. Cir. 2021); *see also, Enplas Display Device Corp. v. Seoul Semiconductor Co.*, 909 F.3d 398, 405 (Fed. Cir. 2008).

In view of the foregoing, the operation of Alden's LED headlight embodiment shown in Figure 5 is simply unclear. (Ex.2040, ¶105.) The lack of detail creates ambiguity as to how the Figure 5 array is controlled. "Anticipation requires that a single reference 'describe the claimed invention *with sufficient precision and detail* to establish that the subject matter existed in the prior art.' For this reason, it has long been understood that ambiguous references do not, as a matter of law, anticipate a claim." *Wasica Fin. GmbH v. Cont'l Auto. Sys., Inc.*, 853 F.3d 1272, 1284 (Fed. Cir. 2017).

Similarly, while Alden describes progressing through the sectors of sensors 51a, 51b of Figure 3 to detect incoming light in connection with Figure 4, it does

not explain how those sensor sectors are mapped to either the one-dimensional array of LED elements 119 shown in Figure 5, the one-dimensional array of switches 115 for that array, or the particular distribution area sectors depicted therein. (Ex.2040, ¶105.) In fact, Alden specifically states that the switch arrays of the light control circuits 55a, 55b shown in Figure 3 are merely for “illustrative purposes.” (Ex.2040, ¶105.) These ambiguities on core functionality establish that Alden’s Fig. 5 embodiment is not enabled for usage with the detection array shown, especially given the fact that Petitioner’s expert could not explain how the sensor array specifically controlled Fig. 5’s LEDs. (Ex.2041, 108:11-109:5.). Petitioner’s anticipation proofs thus fail for reliance on a non-enabled embodiment of Alden. *Apple Inc. v. Corephotonics, Ltd.*, 861 F. App’x 443, 450 (Fed. Cir. 2021).

B. Ground 1: Alden, Ground 2: Alden-Beam, and Ground 3: Alden-Kobayashi

1. Independent Claim 48 (Alden)

- a. Alden Does Not Teach the Claim Limitations**
“selecting a first cluster of the LEDs to emit first light directed towards a first area including the at least the portion of at least one object . . . the first light determined based at least in part on classifying the object”

Independent claim 48 requires “*selecting a first cluster of the LEDs to emit first light directed towards a first area including the at least the portion of at least*

one object . . . the first light determined based at least in part on classifying the object.” Contrary to Petitioner’s contention, however, Alden fails to teach claim limitation 48[i]. (Petition, 33-34.)

First, under the ordinary meaning of the claim term *classifying the object*, Alden fails to expressly or inherently describe that element. Per the claim construction principles laid out in *Phillips v. AWH Corp*, the ordinary meaning of “classify” is to arrange or group in classes according to some system or principle.⁴ (Ex.2040, ¶112.) That ordinary meaning is supported by the specification of the ’551 Patent, which describes identifying and classifying between different types of objects, such as a person, sign, or vehicle. (*See, e.g.*, ‘Ex.1001, 44:67-45:3; 51:59-67; 52:19-27; 52:66-53:4; 63:9-12; 64:46-49; 69:54-57; 75:48-62, 76:33-39.)

Rather than identifying and classifying a vehicle from multiple types of objects, Alden’s system simply detects incoming light having an intensity above a threshold. (Ex.1005, ¶¶[0026-0027]; Ex.2040, ¶113.) In response, the system dims those segmented light distribution elements whose beam segments illuminate those sectors of the distribution area where the detected light is located and selected surrounding sectors. (Ex.1005, ¶[0027-0028].) Thus, at best, which Patent Owner

⁴ Classify: “to arrange or group in classes according to some system or principle.” (Ex.2065, 334.)

does not concede, Alden's system merely assumes that such detected light correlates with the presence of an oncoming vehicle; with no ability to identify and then classify a vehicle from multiple types of objects. (Ex.2040, ¶113-116.) Indeed, Petitioner's proofs for 48[i] simply point to Alden's purported ability to determine "whether the object is an oncoming vehicle, based on sensed light above a threshold." (Petition, 33-34.) Accordingly, Alden fails to expressly satisfy *the classifying the object* element of claim 48.

As the Petition fails to allege, let alone prove, that limitation 48[i] is met by inherent anticipation, any new arguments would be impermissible. *Colas Sols., Inc. v. Blacklidge Emulsions, Inc.*, 759 F. App'x 986 (Fed. Cir. 2019).

Finally, Alden fails to enable any mechanism for *classifying the object*. The Alden system assumes and responds in the same fashion regardless of the actual source of such light, *e.g.*, motorcycles, streetlights, house lights, roadside reflectors, etc. (Ex.2040, ¶115.) Accordingly, Alden not only fails to describe the *classifying the object* element, it further fails to enable any teaching that correlates with **how** the claim element would be achieved. (Ex.2040, ¶115.) *Seymour*, 78 U.S. at 555 (*See*, §VII.B.6., *infra*.)

Because Alden's system, at best, merely assumes that such detected incoming light above a threshold from any and all sources always indicates the presence of an oncoming vehicle, the system never performs the function of

assigning an object a classification from among multiple classes or types of objects and therefore does not, as properly construed, perform the function of classifying an object, as required by claim 48. (Ex.2040, ¶116.) That, in some instances, the source of such detected incoming light might actually be an oncoming vehicle does not negate the fact that the Alden’s system never performs the claim element *classifying an object.* (Ex.2040, ¶116.)

Alden thus discloses nothing more than detecting light above a threshold. (Ex.2040, ¶117.) The ordinary meaning of “detect” is to discover the presence or existence of something⁵, which is a binary determination. (Ex.2040, ¶117.) Therefore, the ordinary meaning of the term “detect” is clearly different from that of “classify” previously noted. (Ex.2040, ¶117.) Simply detecting light above a threshold and then merely assuming that such light always indicates the presence of an oncoming vehicle is not performing the function of assigning an object a classification among multiple classes or types of objects. (Ex.2040, ¶117.) Indeed, Petitioner’s expert has noted that “detection and tracking are simply preliminary steps in the task of vehicle classification.” (Ex.2063, 37.) It is only by misconstruing “classifying the object” in an unreasonably broad manner – *i.e.*, as

⁵ Detect: “to discover the presence or existence of (anything hidden, not clear, etc.)” (Ex.2065, 496.)

merely detecting light – that Petitioner can contend Alden teaches that claim limitation.

Because Alden fails to teach the independent claim 48 limitation of *classifying an object*, Petitioner’s anticipation assertion fails.” *Guangdong Alison Hi-Tech Co. v. Int’l Trade Comm’n*, 936 F.3d 1353, 1363–64 (Fed. Cir. 2019) (citing 35 U.S.C. § 102 (2006) and *SRI Int’l, Inc. v. Internet Sec. Sys., Inc.*, 511 F.3d 1186, 1192 (Fed. Cir. 2008)).

b. Alden Does Not Teach the Claim Limitations 48[j] “control light emitted from the first cluster directed towards the first area to be different in at least one emission characteristic, based on the first light determination, from second light emitted from a second, different cluster of the LEDs, directed towards one or more illuminated second areas at a common elevation with the first area and laterally adjacent to the area”

Petitioner’s contentions and those statements in the Institution Decision regarding the general and broad functionality of the system described by Alden assume the specific details needed to implement such functionality and to meet limitation 48[j] of independent claim 48. (Petition, 34-36; DI 17.) Indeed, it is the absence of specific details from Alden’s disclosure which demonstrates that Alden fails to teach limitation 48[j]. The ambiguity on these specific details also establishes that Alden fails to provide an enabling disclosure of limitation 48[j].

For example, in its anticipation contention regarding independent claim 48,

Petitioner relies on the headlight 123 with multiple LEDs 119 shown in Figure 5 of Alden. (Petition, 29.) Per the Institution Decision (DI), “Alden’s Figure 3 plainly shows two-dimensional sensor arrays and control circuits ... While Alden’s Figure 5 shows a sectional view of one segmented-headlight embodiment,” (DI, 17.) However, Alden never describes Figure 5 as such. Instead, Alden merely describes a row of LEDs positioned along **the** focal point of a lens. (Ex.1005, ¶[0029].) Alden never mentions any additional rows/columns of LEDs adjacent to the single row of LEDs shown in Figure 5, let alone provides an explanation of how LEDs in any such additional rows/columns of a two-dimensional array would be configured to work relative to a single focal point. (Ex.2040, ¶¶99, 121.) To the contrary, Alden’s depiction of the row of LEDs being positioned along the focal point of the lens undermines a conclusion that Alden’s first embodiment, the LED embodiment in Figure 5, could constitute a two-dimensional array. (*Id.*; *see also*, DI, 17.)

Reliance on the Figure 6 second embodiment to help understand the Figure 5 first embodiment is also inapposite. As mentioned in §V.A., *supra*, the Figure 5 LED, first embodiment is distinct from and incompatible with the Figure 6 second embodiment, which uses an electro-chromatic dimming means and a collimating surface, to generate a two-dimensional array of collimated light. (Ex.1005, ¶¶[0029]; Ex.2040, ¶98.) Because Figure 6 generates a two-dimensional array of collimated light and Figure 3 shows a two-dimensional sensor and switch array, the

two are compatible. Without altering Figure 5, no such compatibility exists. Given the fundamental differences between the Figure 6 electro-chromatic second embodiment and the Figure 5 LED first embodiment, the two embodiments are not analogous. Accordingly, that the Figure 6 embodiment uses “switch array similar to 115 and the process previously described herein” lacks sufficient precision and detail to establish **how** the two-dimensional switch array in Figure 3 could be used to operate the one-dimensional array in Figure 5. (Ex.2040, ¶Turk.)

That same description also undermines a conclusion that the inclusion of a two-dimensional switch array in Figure 3, demonstrates that the LED headlight shown in Figure 5 works with such a two-dimensional switch array. (DI, 17; Ex.2040, ¶122.) To the contrary, the Figure 5 first embodiment depicts a single-row LED array in contrast to the two-dimensional light sensor and two-dimensional switch array shown in Figure 3—further lacking any teaching of **how** the one-dimensional LED array shown in Figure 5 would be controlled by such a two-dimensional switch array. Indeed, Petitioner’s expert indicated that it is **not clear** and he could not explain how the switch array shown in Figure 3 controls the LED array shown in Figure 5 to create the beam spread illustrated therein. (Ex.2041, 108:11-109:5.)

In view of the foregoing, the operation of Alden’s LED headlight embodiment shown in Figure 5 is neither express nor inherent, but rather simply

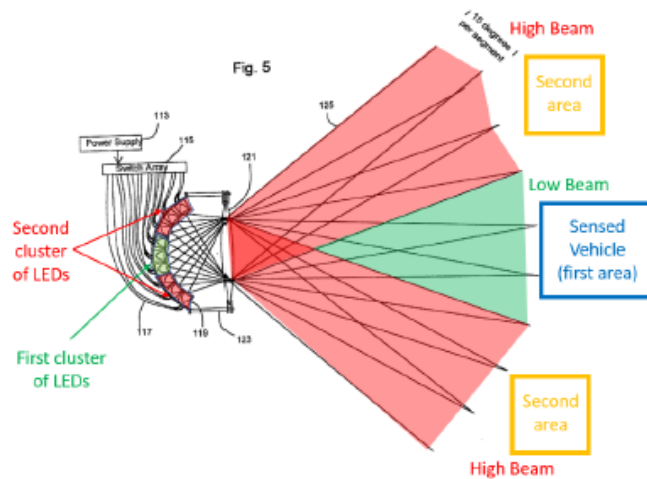
unclear. (Ex.2040, ¶124.) Alden is therefore ambiguous because it does not describe the above-noted limitations of claim 48 with sufficient precision and detail. “Anticipation requires that a single reference ‘describe the claimed invention *with sufficient precision and detail* to establish that the subject matter existed in the prior art.’ For this reason, it has long been understood that ambiguous references do not, as a matter of law, anticipate a claim *Wasica Fin. GmbH v. Cont’l Auto. Sys., Inc.*, 853 F.3d 1272, 1284 (Fed. Cir. 2017). Therefore, Alden does not anticipate independent claim 48. *In re Dowty*, 118 F.2d at 366; *In re Kehl*, 101 F.2d at 195; *Corephotonics*, 861 F. App’x at 451; *Wasica*, 853 F.3d at 1284; *Verve*, 311 F.3d at 1120; *W.L. Gore*, 721 F.2d at 1554; *In re Hughes*, 345 F.2d at 188; *In re Turlay*, 304 F.2d at 899.

Moreover, a prior art reference does not anticipate if it must be modified to meet a challenged claim limitation. *Enplas Display Device Corp. v. Seoul Semiconductor Co.*, 909 F.3d 398, 405 (Fed. Cir. 2008). Alden fails to explain the existence of a two-dimensional array in Figure 5 in any manner – rendering it non-enabling as an anticipatory reference for arguments relying on usage of a two-dimensional array in conjunction with Figure 5.

Notably, Petitioner has not specifically argued that Figure 5 of Alden shows a single row of a two-dimensional LED array, let alone offered any supporting evidence or explanation. Petitioner is “master of its complaint” (*SAS Institute, Inc*

v. Iancu, 138 S. Ct. 1348, 1355 (2018) and, as a result, any attempt by Petitioner to now either address a new anticipation contention or offer a belated argument of obviousness, would be impermissible new argument that should be excluded. *Colas Sols., Inc. v. Blacklidge Emulsions, Inc.*, 759 Fed. App'x 986 (Fed. Cir. 2019); *Henny Penny Corp. v. Frymaster LLC*, 938 F.3d 1324 (Fed. Cir. 2019); *Google LLC v. Uniloc 2017 LLC*, IPR2020-00447, Paper 24 at 13–14 (PTAB May 11, 2021); *Haag-Streit*, IPR2018-01311, Paper 31 (PTAB September 5, 2019); *MModal LLC v. Nuance Communs., Inc.*, 846 F. App'x 900 (Fed. Cir. 2021); *Ariosa Diagnostics v. Verinata Health, Inc.*, 805 F.3d 1359, 1367-1368 (Fed. Cir. 2015).

For its proofs, Petitioner has also mischaracterized Alden's disclosure. (Ex.2040, ¶126.) Petitioner contends that the LED headlight of Alden teaches the claimed limitations based on its annotated versions of Figure 5 and the accompanying description in the specification. (Petition, 29.) It is only by rendering the annotated sensed vehicle with a completely inaccurate scale relative to headlight 123 that Petitioner can contend that Alden "teaches" these independent claim 48 elements. (Ex.2040, ¶128.) Petitioner's annotated Figure 5 is shown below.



(Petition, 29)

As seen in the annotated figure, at the distance shown from the headlight, the annotated oncoming vehicle is too small relative to the size of the headlight. (Ex.2040, ¶127.) Indeed, the annotated vehicle has a width less than that of the headlight structure. Petitioner's annotations are therefore clearly inaccurate and, consequently, a mischaracterization of Alden's disclosure. (Ex.2040, ¶127.) Properly sized at the distance shown relative to the size of the headlight, Petitioner's annotated vehicle would be so large that it would be illuminated by all the beam segments of the headlight. Hence, according to the disclosure of Alden, all the beam segments shown would be dimmed.⁶ (Ex.2040, ¶127.) The annotated

⁶ To clarify, a point from the Institution Decision, Patent Owner does not contend that Alden's Figure 5 headlight embodiment is only capable of illuminating an area no wider than a single vehicle. (*See, e.g.*, DI, 13.)

scenario illustrated thus fails to satisfy the independent claim 48 limitations “control light emitted from the first cluster directed towards the first area to be different in at least one emission characteristic, based on the first light determination, from second light emitted from a second, different cluster of the LEDs, directed towards one or more illuminated second areas at a common elevation with the first area and laterally adjacent to the area.” Petitioner’s contention that Alden anticipates independent claim 48 therefore fails. *Guangdong Alison Hi-Tech Co. v. Int’l Trade Comm’n*, 936 F.3d 1353, 1363–64 (Fed. Cir. 2019) (citing 35 U.S.C. § 102 (2006) and *SRI Int’l, Inc. v. Internet Sec. Sys., Inc.*, 511 F.3d 1186, 1192 (Fed. Cir. 2008)).

Correctly understood, Alden’s disclosure clearly fails to expressly teach the above-noted limitations of independent claim 48. Indeed, Petitioner’s expert admits that its annotations “should be considered only as high-level representations.” (Ex.1003, ¶75.) In that regard, Petitioner’s reliance on the patterns and shapes of emission are misplaced. Annotating a “high-level representation” for which Dr. Papanikolopoulos cannot describe the beam shapes and/or whether the beams overlap, fails to evidence correlation between the Fig. 5 annotation and an actual output other than maybe that Fig. 5 is generally

suggestive of an output. (Ex.2041, 110:20-111:8; Ex.2040, ¶129.) Given Dr. Papanikolopoulos's uncertain opinions about Figure 5, the placement of a vehicle into that Figure, proves little, except maybe that the vehicle would be illuminated by the lamp at some scale. (*Id.*)

Even if it is assumed, as suggested in the Decision (DI, 18-19), that Petitioner's annotations do not and need not precisely represent Alden's express disclosure, any purported anticipation must then be based on inherency. If Petitioner's annotations do not precisely represent Alden's disclosure, then they necessarily depict operations/scenarios not expressly described in Alden as Figure 5 "is a concept" that "doesn't give [] any information how many rows, how many columns we have," according to Petitioner's expert. (Ex.2041, 108:11-109:5.) As a result, any purported anticipation must then be based on inherency, an argument which Petitioner did not advance. (Ex.2040, ¶130). Setting that aside, to establish inherency, Petitioner's annotations must "necessarily flow" from Alden's express disclosure. That is, they must be inevitable; a mere possibility is insufficient. *See Ex parte Levy*, 17 USPQ2d 1461, 1464 (Bd. Pat. App. & Inter. 1990); *See In re Rijckaert*, 9 F.3d 1531, 1534 (Fed. Cir. 1993). Because, per Petitioner's expert, Fig. 5 "does not give any information how many rows ... we have," Petitioner cannot rely on Alden's express teachings; Petitioner's anticipation proofs fail. (Ex.2041, 108:11-109:5; Ex.2040, ¶130.)

Once again, any attempt by Petitioner to now address this failing in its anticipation contention would be impermissible new argument and must be excluded. *See SAS*, 138 S. Ct. at 1355; *Colas*, 759 F. App'x 986; *Henny Penny*, 938 F.3d 1324; *Google LLC v. Uniloc 2017 LLC*, IPR2020-00447, Paper 24 at 13–14 (PTAB May 11, 2021); *Haag-Streit*, IPR2018-01311, Paper 31 (PTAB September 5, 2019); *MModal*, 846 F. App'x 900; *Ariosa*, 805 F.3d at 1367-1368.

2. Independent Claim 56: Alden Does Not Teach the Claim Limitations “*reduce intensity of illumination to non-glaring illumination of a first area associated with the at least one other vehicle, relative to intensity of illumination on both sides of the first area at elevations common with the first area illuminated by a second cluster of the LEDs, by control of emission from the first cluster*”

Alden fails to teach the above-noted independent claim 56 limitations for at least the same reasons as set forth above in connection with independent claim 48. That is, Alden is ambiguous because it does not describe the above-noted independent claim 56 limitations clearly and unambiguously. (Ex.2040, ¶132.) Indeed, Alden is also incapable of satisfying those claim limitations, particularly “*reduce intensity of illumination to non-glaring illumination of a first area associated with the at least one other vehicle . . . relative to intensity of illumination on both sides of the first area at elevations common with the first area illuminated by a second cluster of the LEDs.*” Alden also fails to enable the above-

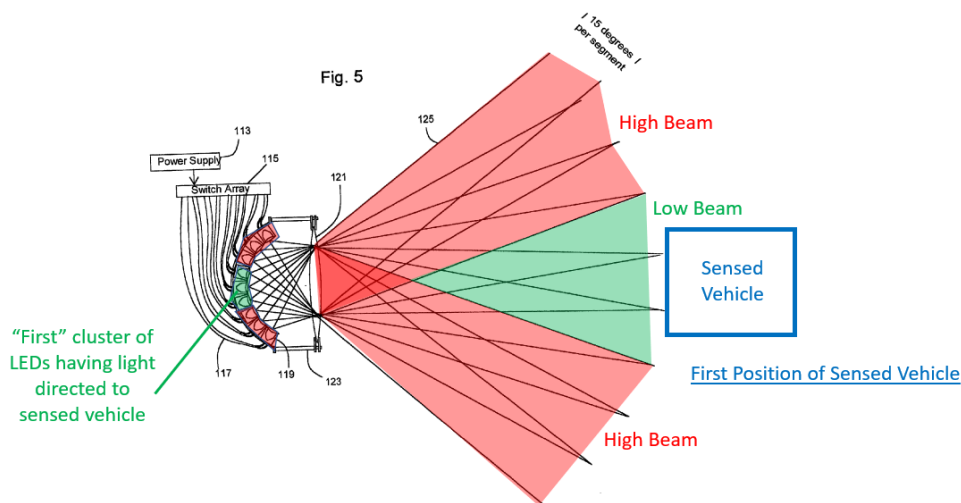
noted independent 56 claim limitations because it does not describe them with sufficient precision to establish their existence as prior art. (*Id.*) Petitioner has also mischaracterized Alden's disclosure which, properly understood, fails to teach those claim limitations either expressly or inherently. (*Id.*) Alden therefore fails to anticipate independent claim 56. *In re Dowty*, 118 F.2d at 366; *In re Kehl*, 101 F.2d at 195; *Corephotonics*, 861 F. App'x at 451; *Wasica*, 853 F.3d at 1284; *Verve* 311 F.3d at 1120; *W.L. Gore*, 721 F.2d at 1554; *In re Hughes*, 345 F.2d at 188; *In re Turlay*, 304 F.2d at 899; *Ex parte Levy*, 17 USPQ2d 1461, 1464 (Bd. Pat. App. & Inter. 1990); *In re Rijckaert*, 9 F.3d 1531, 1534 (Fed. Cir. 1993).

3. Independent Claim 64: Alden Does Not Teach the Claim Limitations (i) “control a first change to one or more characteristics of the light associated with the first cluster of the LEDs that is directed towards the other vehicle, that diminishes glare to a driver of the other vehicle when the other vehicle is at the first position”, and (ii) “control a second, subsequent change, to one or more characteristics of the light that is subsequently directed towards the other vehicle, that diminishes glare to the driver of the other vehicle when the other vehicle is at the second position”

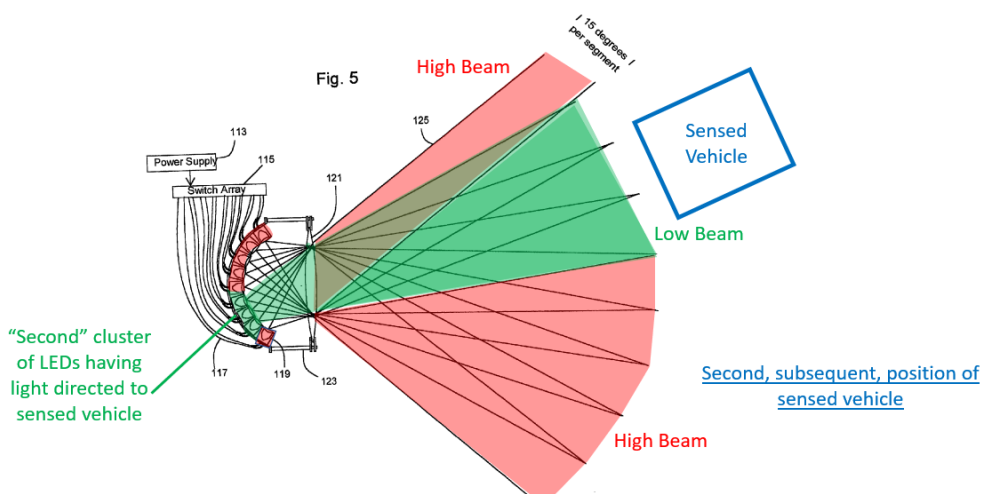
Alden fails to teach the above-noted independent claim 64 limitations for at least the same reasons as set forth above in connection with independent claim 48 and 56. That is, Alden is ambiguous because it does not describe the above-noted independent claim 64 limitations clearly and unambiguously. (Ex.2040, ¶135.) Indeed, Alden is also incapable of satisfying those claim limitations, particularly

“control a first change to one or more characteristics of the light associated with the first cluster of the LEDs that is directed towards the other vehicle, that diminishes glare to a driver of the other vehicle” and “control a second, subsequent change, to one or more characteristics of the light that is subsequently directed towards the other vehicle, that diminishes glare to the driver of the other vehicle when the other vehicle is at the second position.” Alden also fails to enable the above-noted independent 64 claim limitations because it does not describe them with sufficient precision to establish their existence as prior art. (*Id.*) Petitioner has also mischaracterized Alden’s disclosure which, properly understood, fails to teach those claim limitations either expressly or inherently. (*Id.*) Alden therefore fails to anticipate independent claim 64. *In re Dowty*, 118 F.2d at 366; *In re Kehl*, 101 F.2d at 195; *Corephotonics*, 861 F. App’x at 451; *Wasica* 853 F.3d at 1284; *Verve*, 311 F.3d at 1120; *W.L. Gore*, 721 F.2d at 1554; *In re Hughes*, 345 F.2d at 188; *In re Turlay*, 304 F.2d at 899; *Ex parte Levy*, 17 USPQ2d 1461, 1464 (Bd. Pat. App. & Inter. 1990); *In re Rijckaert*, 9 F.3d 1531, 1534 (Fed. Cir. 1993).

As noted, Petitioner has mischaracterized Alden’s disclosure. Petitioner contends that the LED headlight of Alden teaches the claimed limitations based on its annotated versions of Figure 5 and the accompanying description in the specification. (Petition, 45-50.) Petitioner’s annotated Figure 5 is shown below.



(Petition, 47, 49)



(Petition, 50)

Petitioner's annotations of Figure 5, however, are inaccurate. (Ex.2040, ¶137.) The annotated vehicle is an oncoming vehicle that is traveling toward the equipped vehicle.⁷ (*Id.*) The distance between those vehicles is therefore

⁷Petitioner states that the annotated vehicle is an "oncoming vehicle [that] moves across the field-of-view" in connection with similar argumentation

decreasing over time. (*Id.*) As a result, the annotated oncoming vehicle could not physically move from the first position shown to the subsequent second position shown yet remain at the same distance shown from the headlight. (*Id.*) That is, the annotated oncoming vehicle is physically incapable of moving from the first to the second position shown while remaining at substantially the same distance from the equipped vehicle headlight. (*Id.*) The only way a vehicle could move from the first position to the second and remain at the same distance from the headlight would be if that vehicle is moving laterally relative to the equipped vehicle, in which case the light emitted by the headlights of that laterally moving vehicle would not be detected by the sensors of the equipped vehicle. (*Id.*)

Patent Owner's argument concerning movement of Petitioner's annotated vehicle and its distance from the LED headlamp of Figure 5 do not rely on scale or a "collision course" between the equipped vehicle and the annotated vehicle, but on the laws of physics and Alden's light sensor. (Ex.2040, ¶138.) In that regard, the annotated vehicle is not "generally oncoming." (DI, 19.) More specifically, the annotated vehicle cannot be an oncoming vehicle – presenting two headlights emitting light for detection by the equipped vehicle light sensors – yet remain at the same distance from the equipped vehicle at two different points in time.

concerning independent claim 72. (Petition, 56.)

(Ex.2040, ¶138.) Conversely, the annotated vehicle moving laterally relative to the equipped vehicle will not present two headlights emitting light for detection by the equipped vehicle light sensors. (Ex.2040, ¶¶137-138.)

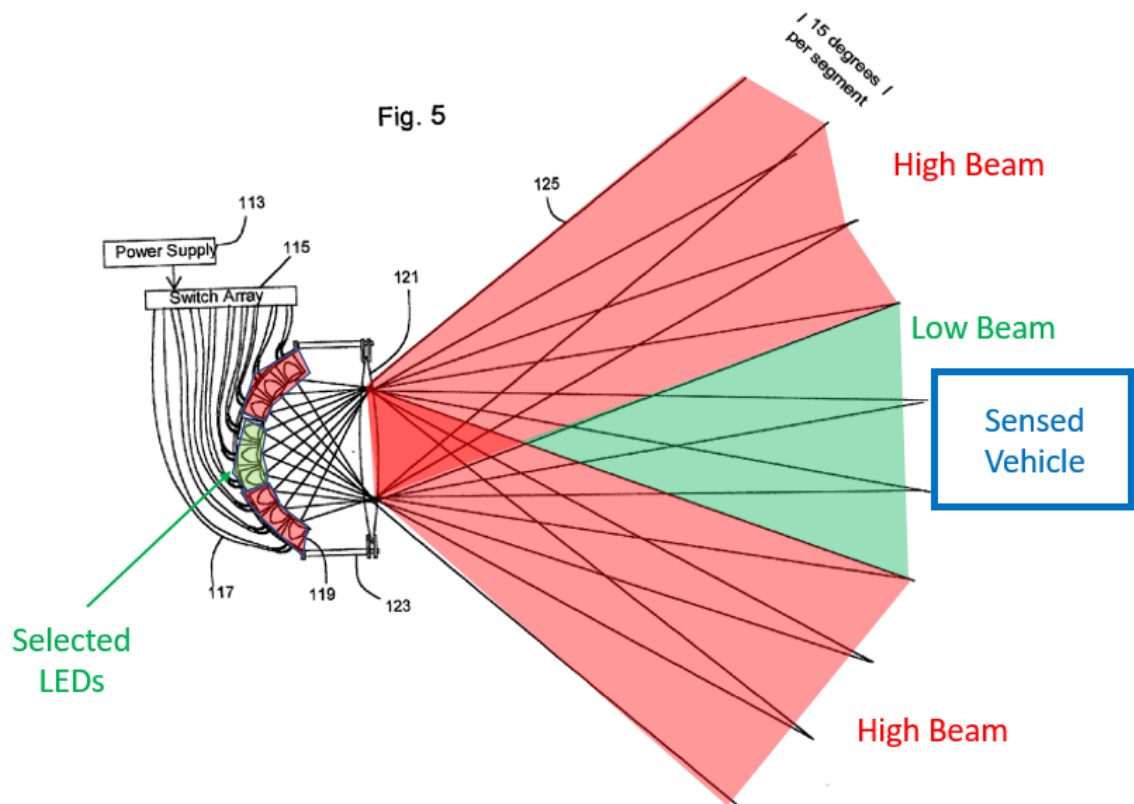
It is only by completely disregarding these physical realities that Petitioner can contend that Alden “teaches” the above-noted limitations of independent claim 64. (Ex.2040, ¶139.) Petitioner’s contention that Alden anticipates independent claim 64 therefore fails. *Guangdong Alison Hi-Tech Co. v. Int’l Trade Comm’n*, 936 F.3d 1353, 1363–64 (Fed. Cir. 2019) (citing 35 U.S.C. § 102 (2006) and *SRI Int’l, Inc. v. Internet Sec. Sys., Inc.*, 511 F.3d 1186, 1192 (Fed. Cir. 2008)).

4. **Independent Claim 72: Alden Does Not Teach the Claim Limitations** (i) “*vary illumination provided to the target by the selected cluster, relative to illumination provided to areas laterally adjacent to the target and provided by at least one LED different from LEDs in the selected cluster*” and (ii) “*maintain a variance of illumination provided to the target relative to the laterally adjacent areas, when subsequent data from one or more of the cameras indicates a change in position of the target relative to the motor vehicle, by repeating the determination of target location, selection of the cluster and variance to illumination provided to the target, relative to the laterally adjacent areas, based on the subsequent data*”

Alden fails to teach the above-noted independent claim 72 limitations clearly and unambiguously. Nor does Petitioner’s proof demonstrate that the claimed variance, is “maintained” for a second location as the target moves. (Ex.2040,

¶¶142-143.)

Petitioner's proof for "vary illumination provided to the target.... Relative to illumination provided to areas laterally adjacent to the target" fails. Petitioner shows the following figure:



(Petition, 54)

It is clear from this figure that the areas laterally adjacent the target are also illuminated in low beams. (Ex.2040, ¶143.)

Further, even were there a point in space where the corners of the annotated vehicle abut the edges of the triangular beam shown, the claim also calls for

“maintaining the variance... relative to the laterally adjacent areas when subsequent data indicates a change in position of the target relative to the motor vehicle.” Alden’s control function of Figure 3/4 does not clearly and unambiguously provide for such a second situation – especially using the beam pattern shown in Figure 5. (Ex.2040, ¶143.)

When subsequent data indicates a change in position, since the position of the target is definitionally changed, Petitioner’s proof must show or explain a second location to which the claimed constraints apply, and this is not shown. Petitioner contends that Alden selects and controls LEDs providing “light to the sectors (or zones) where the target, or oncoming vehicle, is present, and dimming the light directed to these sectors relative to laterally adjacent sectors that are switched to high beam.” (Petition, 56.) Accordingly, the nine-beam, disparately aimed array of Figure 9 has never been shown to be able to create and maintain the claimed variance of illumination, which is relative to the target, and not the sector. (Ex.2040, ¶144.) Alden has not been shown to satisfy, and indeed may be incapable of satisfying, those claim limitations. (Ex.2040, ¶145.)

Alden also fails to enable the above-noted independent 72 claim limitations because it does not describe them with sufficient precision to establish their existence as prior art. (Ex.2040, ¶145.) Alden therefore fails to anticipate independent claim 72. *In re Dowty*, 118 F.2d at 366; *In re Kehl*, 101 F.2d at 195;

Corephotonics, 861 F. App'x at 451; *Wasica*, 853 F.3d at 1284; *Verve*, 311 F.3d at 1120; *W.L. Gore*, 721 F.2d at 1554; *In re Hughes* 345 F.2d at 188; *In re Turlay*, 304 F.2d at 899; *Ex parte Levy*, 17 U.S.P.Q.2d 1461, 1464 (Bd. Pat. App. & Inter. 1990); *In re Rijckaert*, 9 F.3d 1531, 1534 (Fed. Cir. 1993).

5. Independent Claim 80: Alden Does Not Teach the Claim Limitations “*change, responsive to the positions associated with the target, first light associated with one or more LEDs aimed toward at least a portion of the target, relative to second light associated with other one or more of the LEDs aimed laterally adjacent the target on either side, as the target moves relative to the motor vehicle*”

Alden fails to teach the above-noted independent claim 80 limitations clearly and unambiguously. Petitioner fails to identify, for example, which LEDs are providing “light associated with one or more of the LEDs aimed laterally adjacent the target on either side.” (Ex.2040, ¶146.) Similar to claim 72, Petitioner does not adequately demonstrate that the claimed change occurs as the target moves, because Petitioner does not demonstrate the subsequent change at a second time, as claimed. (*Id.*)

Petitioner rejects the claim by analogy to claim 48[g], 64[l] and 72[m]. Because elements 48[g] and 64[l] do not relate to the relativistic concept of control as claimed in 80, the analogy thereto is not adequately explained. 72[m] has the problems noted with respect to claim 72 – and Petitioner’s proof is again loosely

directed at sector-based analysis with insufficient detail to even demonstrate the different language of claim 80. (Petition, 86; Ex.2040, ¶147.) Accordingly, Alden has not been shown to satisfy those limitations of claim 80, particularly “*change . . . first light associated with one or more LEDs aimed toward at least a portion of the target, relative to second light associated with other one or more of the LEDs aimed laterally adjacent the target on either side, as the target moves relative to the motor vehicle.*” (*Id.*)

Alden therefore fails to anticipate independent claim 80. *In re Dowty*, 118 F.2d at 366; *In re Kehl*, 101 F.2d at 195; *Corephotonics*, 861 F. App’x at 451; *Wasica* 853 F.3d at 1284; *Verve*, 311 F.3d at 1120; *W.L. Gore* 721 F.2d at 1554; *In re Hughes*, 345 F.2d at 188; *In re Turlay*, 304 F.2d at 899; *Ex parte Levy*, 17 U.S.P.Q.2d 1461, 1464 (Bd. Pat. App. & Inter. 1990); *In re Rijckaert*, 9 F.3d 1531, 1534 (Fed. Cir. 1993).

6. Dependent Claims 50/58/66/74/82: Alden Does Not Teach the Claim Limitations “*identify an upcoming road curvature*” and “*accommodate the upcoming road curvature by adaptation of a light pattern of at least one of the at least one headlamps*”

Dependent claims 50/58/66/74/82 require that the illuminating device identify and accommodate the upcoming road curvature by adaptation of a light pattern of at least one of the at least one headlamps. Contrary to Petitioner’s contentions, Alden fails to teach such claim limitations.

Critically, Alden's disclosure does nothing more than mention in a single sentence, "[a]n equipped vehicle 153 senses that the road turns by receiving light from reflectors such as a reflector 157." (Ex.1005, ¶[0036]; Ex.2040, ¶149.) Alden's disclosure lacks any teaching or description of how to do so. Alden never describes *how* its system can sense a "curve" by detecting incoming light from a reflector or what to do with beam segments and distribution area sectors if it did sense a "curve." (Ex.2040, ¶149.)

Dependent claims 50/58/66/74/82 recite "identify an upcoming road curvature." Alden includes no methodology for distinguishing between a detected road reflector and a detected vehicle headlamp. Petitioner's expert opined that there are "two use cases in Alden. One is basically headlights maximizing visibility for the driver... the second one is actually using the same logic, which is described in figures 3, 4 and 5." (Ex.2041, 74:25-75:2.) He continued "the reflectors... will have the same appearance on the image like the headlights." (*Id.*) This is problematic, because, as Petitioner's expert stated – "so I will have a rectangle like – but instead of having dim light I'm going to have high beam." (Ex.2041, 80:9-14.) This means that though Alden will require completely different controls for these varied circumstances, it views the reflectors and headlamps as "the same." (Ex.2040, ¶150.)

Petitioner also includes the rotation sensor in its argument. (Petition, 55.)

The claims call for an “upcoming” road curvature, and the suggestion that people are going to be steering into the curve prior to reaching the curve is unreasonable. (Ex.2040, ¶151.) Even using the “steering sensor,” the system could not identify an “upcoming road curvature.” (*Id.*) Also, vehicles not turning in curves use steering while driving, specifically, to change lanes. (*Id.*) Thus, the suggestion that the mere detection of light coupled with a steering change would be sufficient to distinguish between road signs and detected vehicles is outside the corners of Alden and could raise significant problems – every time a vehicle tried to change lanes while detecting an oncoming vehicle, it would presumably create the output pattern of Fig. 11. (*Id.*)

Indeed, there is no teaching or description in Alden of how detected light from roadside reflectors is distinguished from any other detected light. (Ex.2040, ¶152.) Petitioner’s own expert indicated that Alden’s detection of incoming light from roadside reflectors is accomplished in the same fashion as its detection of any other incoming light (Ex.2041, 79:7-80:12.)

As no supportive disclosure exists, Alden’s singular mention of sensing that a road curves by receiving light from roadside reflectors is not enabled. *Seymour*, 78 U.S. at 555. Since Alden cannot identify an upcoming curve, Alden does not and cannot teach accommodating an upcoming road curve by adaptation of a light pattern of a headlight. Petitioner’s anticipation contentions concerning claims

50/58/66/74/82 therefore fail. *Id.*

Moreover, Petitioner is “master of its complaint” (*SAS Institute, Inc v. Iancu*, 138 S. Ct. 1348, 1355 (2018)) and, as a result, any attempt by Petitioner to now address its failure, such as by citing to any other disclosure in Alden or by offering a belated argument of obviousness, would be impermissible new argument and should be excluded. *Colas Sols., Inc. v. Blacklidge Emulsions, Inc.*, 759 Fed. App’x 986 (Fed. Cir. 2019); *Henny Penny Corp. v. Frymaster LLC*, 938 F.3d 1324 (Fed. Cir. 2019); *Google LLC v. Uniloc 2017 LLC*, IPR2020-00447, Paper 24 at 13–14 (PTAB May 11, 2021); *Haag-Streit*, IPR2018-01311, Paper 31 (PTAB September 5, 2019); *MModal LLC v. Nuance Communs., Inc.*, 846 F. App’x 900 (Fed. Cir. 2021); *Ariosa Diagnostics v. Verinata Health, Inc.*, 805 F.3d 1359, 1367-1368 (Fed. Cir. 2015).

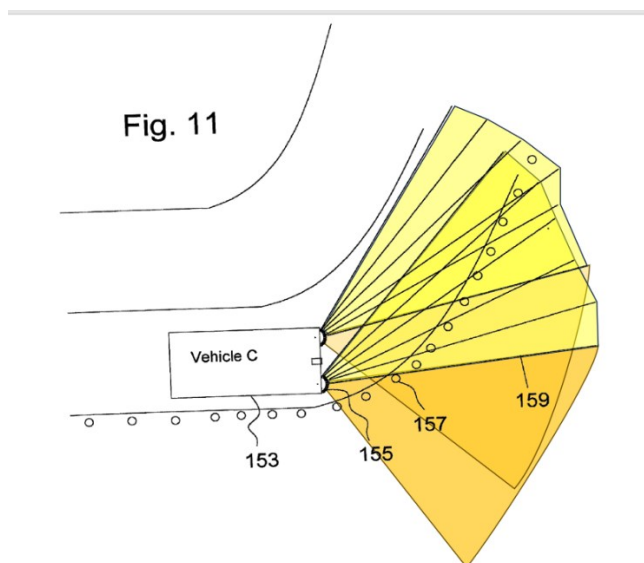
7. Dependent Claims 51/59/67/75/83: Alden Does Not Teach the Claim Limitations “*accommodate the road curvature by changing illumination in at least a direction of the road curvature by adaptation of the light pattern in at least one of color, intensity, or spatial distribution*”

Dependent claims 51/59/67/75/83 require that the illuminating device accommodate the road curvature by changing illumination in at least a direction of the road curvature by adaptation of light pattern in at least one of color, intensity or spatial distribution. Contrary to Petitioner’s contentions, Alden fails to teach such

claim limitations, for the reasons set forth above in connection with claims 50/58/66/74/82 as well as those detailed below.

Dependent claims 51/59/67/75/83 depend indirectly from independent claims 48/56/64/72/80, respectively. Because those independent claims recite LEDs, Petitioner's anticipation contentions relating thereto rely on Alden's first embodiment, the LED headlight embodiment of Figure 5. (Petition, 11-42, 45-50, 53-56, 58-59.)

In its anticipation contentions concerning dependent claims 51/59/67/75/83, Petitioner asserts that Figure 11 of Alden is an illustration of the operation of the LED headlight embodiment of Figure 5. (Petition, 62-67.) More specifically, according to Petitioner, the headlights 155 in Figure 11 are controlled to dim to low beam those LEDs 119 emitting beam segments in directions generally away from the curve, while the beam segments emitted by the remaining LEDs 119 are at high beam. (Petition, 62-67; Ex.1003, ¶¶134-136; Ex.2041, 74:3-78:4.) Figure 11 is annotated below to demonstrate such operation. (Ex.2040, ¶156.)



(Ex.1005, FIGURE 11, Annotated)

Significantly, however, in all segmented beam headlight embodiments of Alden, the beam segments are always active at high intensity unless specifically dimmed.⁸ (See, §V.A., *infra.*) As a result, dimming to low beam intensity only those LEDs 119 emitting beam segments in directions generally away from the curve, while leaving all other LEDs 119 activated at high beam intensity, does not result in any adaptation in intensity of the pattern output by the LED headlights 155 in the direction of the curve. (Ex.2040, ¶157.) For the same reason, and

⁸ For example, in connection with Figure 3, Alden states that those portions of the segmented headlight not dimmed will be on high beam. (Ex.1005, ¶[0027], ¶[0030], ¶[0035].)

because all LEDs 119 in the headlights 155 remain activated at all times, such operation also does not result in any adaptation of a spatial distribution of the pattern output by the LED headlights 155 in the direction of the curve. (Ex.2040, ¶157.)

In view of the foregoing, the operation illustrated in Figure 11 of the LED headlight 123 of Figure 5 clearly does not change illumination in a direction of a road curvature by adaptation of a light pattern in color, intensity, or spatial distribution. (Ex.2040, ¶158.) Petitioner's anticipation contentions concerning dependent claims 51/59/67/75/83 therefore fail. *Guangdong Alison Hi-Tech Co. v. Int'l Trade Comm'n*, 936 F.3d 1353, 1363–64 (Fed. Cir. 2019) (citing 35 U.S.C. § 102 (2006) and *SRI Int'l, Inc. v. Internet Sec. Sys., Inc.*, 511 F.3d 1186, 1192 (Fed. Cir. 2008)).

Moreover, contrary to Petitioner's contention, there is no teaching in Alden of dimming to low beam intensity only those LEDs 119 emitting beam segments in directions generally away from the curve, while switching all other LEDs 119 to high beam. (Petition, 62-67; Ex.1003, ¶¶134-136; Ex.2041, 74:3-78:4; Ex.2040, ¶159.) As previously demonstrated, in all segmented beam headlight embodiments of Alden, the beam segments are always active at high intensity unless specifically dimmed. (Ex.1005, ¶¶[0027], [0030], [0035].) (*See*, §V.A., *infra*.) Alden does not anticipate if it must be modified to meet a challenged claim limitation. *Enplas*

Display Device Corp. v. Seoul Semiconductor Co., 909 F.3d 398, 405 (Fed. Cir. 2008).

Because it fails to expressly teach dimming to low beam intensity only those LEDs 119 emitting beam segments in directions generally away from the curve, while switching all other LEDs 119 to high beam, Alden can only meet the above-noted claim limitations if such operation is inherent in its disclosure. (Ex.2040, ¶ 160.) That is, such operation must be “inevitable” or “necessarily flow” from Alden’s express disclosure. *See Ex parte Levy*, 17 USPQ2d 1461, 1464 (Bd. Pat. App. & Inter. 1990); *In re Rijckaert*, 9 F.3d 1531, 1534 (Fed. Cir. 1993).

Because the Petition does not advance inherency arguments or supply the attendant proofs, Petitioner is limited to arguments related to the express teachings of Alden. Even if Petitioner were allowed to make belated inherency arguments, as demonstrated above, those LEDs 119 emitting beam segments in directions generally away from the curve could be dimmed to low beam, while all other LEDs 119 already active at high beam intensity remain at high beam intensity. Alden therefore also fails to inherently anticipate dependent claims 51/59/67/75/83. (*Id.*)

Additionally, Petitioner is “master of its complaint” (*SAS Institute, Inc v. Iancu*, 138 S. Ct. 1348, 1355 (2018)) and, as a result, any attempt by Petitioner to now address the failings of its anticipation contention based on Alden, such as by

offering a belated argument of obviousness, would be impermissible new argument and should be excluded. *Colas Sols., Inc. v. Blacklidge Emulsions, Inc.*, 759 Fed. App’x 986 (Fed. Cir. 2019); *Henny Penny Corp. v. Frymaster LLC*, 938 F.3d 1324 (Fed. Cir. 2019); *Google LLC v. Uniloc 2017 LLC*, IPR2020-00447, Paper 24 at 13–14 (PTAB May 11, 2021); *Haag-Streit*, IPR2018-01311, Paper 31 (PTAB September 5, 2019); *MModal LLC v. Nuance Communs., Inc.*, 846 F. App’x 900 (Fed. Cir. 2021); *Ariosa Diagnostics v. Verinata Health, Inc.*, 805 F.3d 1359, 1367-1368 (Fed. Cir. 2015).

8. Dependent Claim 51: Alden Does Not Teach the Claim Limitations “*the control of the light emitted from the first cluster includes a change of at least one LED of the cluster to a non-emitting state*”

Dependent claims 51 also requires that the control of the light emitted from the first cluster includes a change of at least one LED of the cluster to a non-emitting state. In addition to the deficiencies in Petitioner’s anticipation contentions concerning dependent claim 51 demonstrated above, Alden also fails to teach these additional dependent claim 51 limitations.

No section of Alden cited by Petitioner teaches changing any LEDs to a non-emitting state. (Petition, 66 (*citing* Ex.1005, ¶¶[0026-0029], [0036], [0039-0040]; Ex.2040, ¶164.) To the contrary, all segments of Alden’s various segmented beam headlight embodiments are always activated at high intensity unless specifically

dimmed. (*See*, §V.A., *infra*.) More specifically, in connection with Figure 3, Alden states that those portions of the segmented headlight not dimmed will be on high beam. (Ex.1005, ¶[0027], [0030], [0035]; Ex.2040, ¶164.) In connection with Figure 6, Alden states that distribution of light is dimmed for an oncoming vehicle but on high beam elsewhere. (Ex.1005, ¶[0030].) In connection with Figure 10, Alden states that those beam segments not diverted for an oncoming vehicle are in high beam intensity. (Ex.1005, ¶[0035].)

Indeed, Petitioner admits Alden's failure to teach changing any LEDs to a non-emitting state in its unpatentability arguments concerning dependent claim 49, which includes similar claim limitations of changing at least one LED of the cluster to a non-emitting state.(Ex.2040, ¶165.) Petitioner contends that dependent claim 49 is an obvious combination of Alden and Beam, relying only on Beam for the purported teaching of changing at least one LED of the cluster to a non-emitting state. (Petition, 76-80.)

By Petitioner's own admission, their contention that Alden anticipates dependent claim 51 must fail. *Guangdong Alison Hi-Tech Co. v. Int'l Trade Comm'n*, 936 F.3d 1353, 1363–64 (Fed. Cir. 2019) (citing 35 U.S.C. § 102 (2006)and *SRI Int'l, Inc. v. Internet Sec. Sys., Inc.*, 511 F.3d 1186, 1192 (Fed. Cir. 2008)).

9. Dependent Claims 53/61/69/77/85: Alden Does Not Teach the Claim Limitations “*identification of the upcoming road curvature is based at least in part on sensor data provided by one or more of the sensors of the vehicle and wherein the adaptation of the light pattern is based at least in part on the sensor data*”

Dependent claims 53/61/69/77/85 require *identification of the upcoming road curvature based at least in part on sensor data provided by one or more of the sensors of the vehicle and wherein the adaptation of the light pattern is based at least in part on the sensor data.*⁹ However, contrary to Petitioner’s contentions, Alden fails to teach these claim limitations.

Dependent claims 53/61/69/77/85 depend indirectly from independent claims 48/56/64/72/80, respectively. Each of those independent claims define the sensor recited as one or more “*for detecting coordinate specific information about the illuminated area.*”

In its anticipation contentions regarding independent claims 48/56/64/72/80, Petitioner cites Alden’s light sensors as the claimed “*one or more sensors for detecting coordinate specific information about an illuminated area.*” (Petition, 20-

⁹ Dependent claims 53/61/69/77/85 depend directly from dependent claims 50/58/66/74/82, respectively, which require accommodating an upcoming road curvature by adaptation of a light pattern.

22, 36-37, 45, 53, 58.) But in its anticipation contentions regarding adaptation of the light pattern based on “the sensor data” recited in dependent claims 53/61/69/77/85, Petitioner cites Alden’s equipped vehicle steering wheel rotation sensor as the sensor providing “the sensor data.” (Petition, 67.)

However, the antecedent basis for the sensor recited in dependent claims 53/61/69/77/85 is the sensor of independent claims 48/56/64/72/80 which, again, is “one or more sensors for detecting coordinate specific information about the illuminated area.” The vehicle steering wheel rotation sensor disclosed in Alden is clearly neither a sensor for detecting, nor capable of detecting nor providing, coordinate specific information about the illuminated area. (Ex.2040, ¶172.)

Petitioner’s anticipation contentions thus fail because Alden’s rotation sensor relied upon by Petitioner does not provide *the sensor data* required by claims 53/61/69/77/85 due to their respective dependence from independent claims 48/56/64/72/80, which recite a *sensor for detecting coordinate specific information about the illuminated area*. *Guangdong Alison Hi-Tech Co. v. Int’l Trade Comm’n*, 936 F.3d 1353, 1363–64 (Fed. Cir. 2019) (citing 35 U.S.C. § 102 (2006) and *SRI Int’l, Inc. v. Internet Sec. Sys., Inc.*, 511 F.3d 1186, 1192 (Fed. Cir. 2008)).

In addition to relying on a sensor that has not been shown to, and cannot, meet the inherited requirements of “the one or more sensors” from independent

claims – steering sensors also cannot be used to detect “upcoming” road curvatures for at least the reasons noted with respect to claim 50 above. (*See* VII(B)(8) *supra*.)

Moreover, Petitioner is “master of its complaint” (*SAS Institute, Inc v. Iancu*, 138 S. Ct. 1348, 1355 (2018)) and, as a result, any attempt by Petitioner to now address this failing in its anticipation contention would be impermissible new argument and should be excluded. *Colas Sols., Inc. v. Blacklidge Emulsions, Inc.*, 759 Fed. App’x 986 (Fed. Cir. 2019); *Henny Penny Corp. v. Frymaster LLC*, 938 F.3d 1324 (Fed. Cir. 2019); *Google LLC v. Uniloc 2017 LLC*, IPR2020-00447, Paper 24 at 13–14 (PTAB May 11, 2021); *Haag-Streit*, IPR2018-01311, Paper 31 (PTAB September 5, 2019); *MModal LLC v. Nuance Communs., Inc.*, 846 F. App’x 900 (Fed. Cir. 2021); *Ariosa Diagnostics v. Verinata Health, Inc.*, 805 F.3d 1359, 1367-1368 (Fed. Cir. 2015).

C. Alden Alone Does Not Render Obvious Any of the Challenged Claims

In addition to its contentions that the Challenge Claims treated in Ground 1 are anticipated by Alden, Petitioner contends in the alternative that those Challenged Claims are obvious based on Alden alone. (Petition, 11, 36, 42, 45, 51, 53, 56, 58, 59, 62, 65, 67, 68.) However, Petitioner has failed to meet any of the requirements necessary to demonstrate obviousness based on Alden alone, instead offering only unsupported conclusory statements. (Ex.2040, ¶176.)

Nowhere in its petition does Petitioner explain its obviousness contention at any level of detail. Instead, Petitioner's contention is based on nothing more than cursory and completely conclusory statements consisting of no more than a single sentence — essentially: "It's obvious." (Ex.2040, ¶177.)

Petitioner has failed to establish or even identify which elements are required to support an obviousness conclusion, including explaining *how* Alden must be modified (*i.e.*, identifying the differences between the claimed invention and Alden, or those claim elements not taught by but obvious in view of Alden) and explaining *why* a POSITA would be motivated to so modify Alden (*i.e.*, providing some articulated reasoning with some rational underpinning to support an obviousness conclusion). *KSR Int'l Co. v. Teleflex Inc.*, 550 U.S. 398, 418 (2007); *Graham v. John Deere Co.*, 383 U.S. 1, 17-18 (1966). In short, Petitioner cannot argue that Alden anticipates these claim features and then, when that argument proves insufficient, simply assert in the alternative that Alden renders the claimed invention and/or claim features obvious. (Ex.2040, ¶178.)

In that regard, Petitioner cannot simply treat the various features of Alden's embodiments as interchangeable, particularly for anticipation, but also for obviousness. Instead, Alden's disclosure must support any contention of interchangeability. *Net MoneyIN*, 545 F.3d at 1371; *Microsoft*, 878 F.3d at 1068-1069. Extrinsic evidence, such as an expert declaration, on what Alden's different

embodiments could include or would accommodate are not the same as what Alden specifically discloses. *Scripps Clinic & Rsch. Found. v. Genentech, Inc.*, 927 F.2d 1565, 1576 (Fed. Cir. 1991) (*overruled on other grounds by Abbott Lab'ys v. Sandoz, Inc.*, 566 F.3d 1282 (Fed. Cir. 2009)) *see also*, *ActiveVideo Networks, Inc. v. Verizon Communications, Inc.*, 694 F.3d 1312, 1327 (Fed. Cir. 2012) (“The expert failed to explain how specific references could be combined, which combination(s) of elements in specific references would yield a predictable result, or how any specific combination would operate or read on the asserted claims,” such that the “expert’s testimony on obviousness was essentially a conclusory statement.”); *KSR Int’l*, 550 U.S. at 418 (“A patent composed of several elements is not proved obvious by merely demonstrating that each of its elements was, independently, known in the prior art.”). *Raytheon Technologies, Corp. v. General Electric Co.*, 993 F.3d 1374, 1381 (Fed. Cir. 2021) (“In the absence of such other supporting evidence to enable a skilled artisan to make the claimed invention, a standalone §103 reference must enable the portions of its disclosure being relied upon.”).

Petitioner must provide a sufficient rationale to combine Alden’s different embodiments. Having failed to explain sufficiently *why* a POSA would have found it obvious to combine those embodiments, any contentions by Petitioner of obviousness based thereon fail. *KSR Int’l*, 550 U.S. at 418.

Significantly, the Institution Decision agreed that Petitioner had failed to support its obviousness contentions based on Alden alone. (DI, 19-20.) Petitioner is “master of its complaint” (*SAS Institute, Inc v. Iancu*, 138 S. Ct. 1348, 1355 (2018)) and, as a result, any attempt by Petitioner to now address the failings of those obviousness contentions by belatedly offering supporting argument would be impermissible new argument and should be excluded. *Colas Sols., Inc. v. Blacklidge Emulsions, Inc.*, 759 Fed. App’x 986 (Fed. Cir. 2019); *Henny Penny Corp. v. Frymaster LLC*, 938 F.3d 1324 (Fed. Cir. 2019); *Google LLC v. Uniloc 2017 LLC*, IPR2020-00447, Paper 24 at 13–14 (PTAB May 11, 2021); *Haag-Streit*, IPR2018-01311, Paper 31 (PTAB September 5, 2019); *MModal LLC v. Nuance Communs., Inc.*, 846 F. App’x 900 (Fed. Cir. 2021); *Ariosa Diagnostics v. Verinata Health, Inc.*, 805 F.3d 1359, 1367-1368 (Fed. Cir. 2015). In addition, the Board is constrained by the arguments and evidence presented and developed in the Petition and is not at liberty to “raise, address, and decide . . . theories never presented by [Petitioner] and not supported by record evidence.” *In re Magnum Oil Tools Int’l, Ltd.*, 829 F.3d 1364, 1381 (Fed. Cir. 2016) .

VIII. Conclusion

In light of the remarks herein, Patent Owner respectfully requests that the Board find the claims not unpatentable for the ’551 Patent.

Respectfully submitted,

Dated: March 5, 2024

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Certificate of Service

The undersigned hereby certifies that the foregoing **PATENT OWNER'S RESPONSE TO PETITION FOR *INTER PARTES* REVIEW**, including any attachments and exhibits, was served in its entirety on **March 5, 2024** upon the following parties by electronic mail:

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